Europäisches Patentamt

European Patent Office

Office européen des brevets



EP 0 742 202 A2

(12)

#### **EUROPEAN PATENT APPLICATION**

(43) Date of publication: 13.11.1996 Bulletin 1996/46

(21) Application number: 96106956.4

(22) Date of filing: 03.05.1996

(51) Int. Cl.<sup>5</sup>: **C07C 323/48**, C07C 317/28, C07C 323/52, C07C 337/04, C07F 7/10, A01N 33/26, C07C 323/22, C07C 335/32, C07C 317/24, C07C 331/04, C07C 329/16

(84) Designated Contracting States:
AT BE CH DE DK ES FR GB GR IT LI NL PT

(30) Priority: 12.05.1995 JP 137482/95 15.02.1996 JP 50744/96

(71) Applicant: NIHON BAYER AGROCHEM K.K. Tokyo 108 (JP)

(72) Inventors:

 Kitagawa, Yoshinori Moka-shi, Tochigi (JP)

Wada, Katsuaki
 Oyama-shi, Tochigi (JP)

 Kyo, Yoshiko Oyama-shi, Tochigi (JP)

Otsu, Yuichi
 Oyama-shi, Tochigi (JP)

Hattori, Yumi
 Yuki-shi, İbaraki (JP)

Obinata, Toru
 Oyama-shi, Tochigi (JP)

Abe, Takahisa
 Oyama-shi, Tochigi (JP)

 Shibuya, Katsuhiko Minamikawachi-machi (JP)

Andersch, Wolfram, Dr.
 51469 Bergisch Gladbach (DE)

(74) Representative: Linkenhell, Dieter et al Bayer AG Konzernverwaltung RP Patente Konzern 51368 Leverkusen (DE)

(54) Benzophenone hydrazone derivatives as insecticides

(57) Summary Of The Invention

Novel benzophenonehydrazone derivatives represented by the formula (I):

wherein,  $R^1$  is halogen;  $R^2$  is hydrogen or  $C_{1-4}$  alkyl;  $R^3$  is cyano, optically substituted  $C_{1-4}$  alkyl,  $C_{2-4}$  alkenyl,  $C_{3-4}$  alkyl-nyl,  $C_{1-4}$  alkyl-carbonyl or  $C_{1-4}$  alkoxy-thiocarbonyl;  $R^4$  is hydrogen, phenyl, optionally substituted  $C_{1-6}$  alkyl, optionally substituted  $C_{2-8}$  alkenyl,  $C_{2-8}$ 

EP 0 742 202 A2

 $R^5$  is hydrogen, formyl, phenyl, optionally substituted  $C_{1-8}$  alkyl, optionally substituted  $C_{2-8}$  alkenyl, optionally substituted  $C_{1-8}$  alkyl-carbonyl, optionally substituted  $C_{1-6}$  alkyl-carbonyl, optionally substituted  $C_{1-8}$  alkoxy-carbonyl, optionally substituted  $C_{1-8}$  alkoxy-carbonyl, optionally substituted  $C_{2-8}$  cycloalkyl-carbonyl, optionally substituted  $C_{2-8}$  alkenyl-carbonyl or optionally substituted benzoyl;  $R^6$  is hydrogen or halogen;  $R^7$  is hydrogen, halogen or  $C_{1-2}$  alkyl-carbonyl or  $C_{1-4}$  alkoxy-thiocarbonyl;  $R^8$  is 0, 1 or 2, provided that n is 0 when  $R^8$  is cyano,  $R^8$  is a single bond of Anti form or of Syn form.

The benzophenonehydrazone derivatives of the formula (I) have excellent insecticidal activities.

#### Description

5

15

20

25

30

40

55

The present invention relates to novel benzophenone hydrazone derivatives, to processes for the preparation thereof and to their use as insecticides, as well as to novel intermediates for their preparation and to processes for their preparation.

It has been already known that certain 4-substituted-4'-alkysufonyloxybenzophenone hydrazone derivatives have insecticidal activities (see British Crop Protection Conference Pests and Diseases 1984, Vol.2, 405 - 412, Japanese Patent Kokai Publications Sho 54-122261 (=EP-3913-A, USP4394387), Sho 56-45452 (=EP-26040-A, USP4331680, USP4432994), Hei 2-138246 (=EP-355832-A, USP4980373), Hei 3-74356 (DERWENT AN-91-136915), Hei 4-1173 (DERWENT AN-92-053936), Hei 6-25134(=CA2094010), Hei 6-184079 (=USP5340837, USP5405871), Hei 7-149708(=EP-647622), Hei 7-242618(=CA2139465) and Hei 7-247261 (=DERWENT AN-95-363559)).

However, the level and/or duration of activity of these known compounds are not entirely satisfactory in all fields of application, in particular against certain organisms or when low concentrations are applied.

There have now been found novel benzophenone hydrazone derivatives of the formula (I):

wherein

R<sup>1</sup> is halogen,

R<sup>2</sup> is hydrogen or C<sub>1-4</sub> alkyl,

R<sup>3</sup> is cyano, optionally substituted C<sub>1-4</sub> alkyl, C<sub>2-4</sub> alkenyl or C<sub>3-4</sub> alkynyl, C<sub>1-4</sub> alkyl-carbonyl or C<sub>1-4</sub> alkoxy-thiocarbonyl

35 R<sup>4</sup> is hydrogen, phenyl, benzyl, optionally substituted C<sub>1-8</sub> alkyl, optionally substituted C<sub>2-8</sub> alkenyl, -CO-R<sup>8</sup>, -CO-O-R<sup>9</sup> or

is hydrogen, formyl, phenyl, optionally substituted C<sub>1-8</sub> alkyl, optionally substituted C<sub>2-8</sub> alkenyl, optionally substituted C<sub>1-8</sub> alkyl-carbonyl, optionally substituted C<sub>1-6</sub> alkyl-carbonyl, optionally substituted C<sub>1-8</sub> alkoxy-carbonyl, optionally substituted C<sub>1-8</sub> alkoxy-oxalyl, optionally substituted C<sub>2-8</sub> alkenyl-carbonyl or optionally substituted benzoyl,

R<sup>6</sup> is hydrogen or halogen,

R<sup>7</sup> is hydrogen, halogen or C<sub>1-2</sub> alkyt,

n is 0, 1 or 2, provided that n is 0 when R3 is cyano, C1-4 alkyl-carbonyl or C1-4 alkoxy-thiocarbonyl,

is a single bond of Anti form or of Syn form,

is optionally substituted C<sub>1-8</sub> alkyl, optionally substituted C<sub>2-8</sub> alkenyl, optionally substituted phenyl, optionally substituted C<sub>1-8</sub> alkyl-carbonyl or optionally substituted C<sub>1-8</sub> alkoxy-carbonyl, or hydrogen,

 $R^9$  is optionally substituted  $C_{1-8}$  alkyl, optionally substituted  $C_{3-8}$  cycloalkyl, optionally substituted  $C_{2-8}$  alkenyl or optionally substituted  $C_{3-8}$  alkynyl,

R<sup>10</sup> is hydrogen or C<sub>1-4</sub> alkyl,

R<sup>11</sup> is hydrogen, optionally substituted C<sub>1-4</sub> alkyl or optionally substituted phenyl and,

#### Z is oxygen or sulfur.

5

10

15

20

25

30

35

45

50

55

The compounds of the formula (I), according to the invention, are obtained when

(a) in the case where R<sup>5</sup> is hydrogen: compounds of the formula (II)

$$\begin{array}{c|c}
R^6 & 0 \\
R^7 \\
C & C \\
R^7
\end{array}$$

$$\begin{array}{c}
CH-S(O)n-R^3 \\
R^2
\end{array}$$
(II)

wherein R1, R2, R3, R6, R7 and n are defined as above, are reacted with compounds of the formula (III)

wherein  $R^4$  is defined as above; in the presence of an inert solvent, and, if appropriate, in the presence of an acid catalyst,

or

(b) in the case where R5 is hydrogen and R4 is

and R<sup>11</sup> is not hydrogen, then R<sup>11</sup> is replaced by R<sup>12</sup>, then R<sup>12</sup> is optionally substituted C<sub>1-4</sub> alkyl or optionally substituted phenyl: compounds of the formula (IV)

$$\begin{array}{c}
H \\
N \\
R^{5}
\end{array}$$

$$\begin{array}{c}
R^{7} \\
CH \\
R^{2}
\end{array}$$

$$\begin{array}{c}
(IV) \\
(IV) \\
R
\end{array}$$

wherein R1, R2, R3, R6, R7 and n are defined as above, are reacted with compound of the formula (V)

wherein R12 is optionally substituted C1-4 alkyl or optionally substituted phenyl, in the presence of an in rt solvent,

5

10

15

20

25

(c) in the case where R4 is -CO-R8 or -CO-O-R9, provided that R8 is not hydrogen, then R8 or -O-R9 is replaced by R<sup>13</sup>, the aforementioned compounds of the formula (IV) are reacted with compounds of the formula (VI)

wherein hal is chlorine or bromine and R13 is R8 or -O-R9, in the presence of an inert solvent, and if appropriate in the presence of an acid binder,

(d) in the case where  $\mathbb{R}^5$  is not hydrogen, then  $\mathbb{R}^5$  is replaced by  $\mathbb{R}^{14}$ : compounds of the formula (VII)

30

wherein R1, R2, R3, R4, R6, R7 and n have the same meaning as mentioned above, are reacted with compounds of the formula (VIII)

35

40

wherein hal and R14 have the same meaning as mentioned above, in the presence of an inert solvent, and if appropriate in the presence of an acid binder,

(e) in the case where n is 1: compounds the formula (IX)

$$\begin{array}{c}
R^{5} \\
N \\
R^{6}
\end{array}$$

$$\begin{array}{c}
R^{7} \\
C \\
C \\
R^{7}
\end{array}$$

$$\begin{array}{c}
C \\
C \\
R^{7}
\end{array}$$

$$\begin{array}{c}
C \\
C \\
R^{2}
\end{array}$$
(IX)

50

55

45

wherein R1, R2, R3, R4, R5, R6 and R7 have the same meaning as mentioned above, are oxidized in the presence of an inert solvent,

(f): in the cas where n is 2: compounds of th formula (X)

$$\begin{array}{c}
R^{5} \\
N \\
R^{6}
\end{array}$$

$$\begin{array}{c}
R^{7} \\
C \\
C \\
R^{7}
\end{array}$$

$$\begin{array}{c}
C \\
C \\
R^{7}
\end{array}$$

$$\begin{array}{c}
C \\
C \\
R^{2}
\end{array}$$

$$\begin{array}{c}
(X) \\
$

wherein R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup> and R<sup>7</sup> have the same meanings as mentioned above and q is 0 or 1, are oxidized in the presence of an inert solvent.

The benzophenone hydrazone derivatives of the formula (I) according to the invention exhibit powerful insecticidal action, especially against lepidoptera, coleoptera and soil insects.

According to the invention, unexpectedly, the benzophenone hydrazone derivatives of the formula (I) exhibit substantially, superior insecticidal action as compared with those of the compounds described in the above references which are similar to the compounds of the invention.

In the compounds of the formula (I) according to the invention, and the respective formulae representing their intermediates employed for the preparation of the compounds of formula (I), each of the halogen as well as the halogen parts of the haloalkyl, haloalkenyl and haloalkoxy represent fluorine, chlorine, bromine and iodine, preferably fluorine, chlorine or bromine.

Alkyl represents, for example, methyl, ethyl, propyl, isopropyl, n-(iso-, sec- or tert-)butyl, n-(iso-, sec-, tert- or neo-)pentyl and n-(iso-, sec-, tert- or neo-)hexyl, preferably, methyl, ethyl, propyl, isopropyl and n-(iso-, sec- or tert-)butyl.

Alkenyl represents, for example, vinyl, allyl, isopropenyl, 1-methyl-2-propenyl, 2-methyl-2-propenyl, 2- (or 3-)butenyl, 2-(3- or 4-)pentenyl,

Alkynyl represents, for example, propargyl.

Phenyl and the phenoxy may optionally be substituted by one or more than one substituent. The substituent(s) of those are selected from the group consisting of halogen(fluorine, chlorine, bromine), cyano, nitro, alkyl (methyl, ethyl, propyl or isopropyl), haloalkyl(trifluoromethyl), alkoxy(methoxy, ethoxy), haloalkoxy (trifluoromethoxy) and alkylthio(methylthio).

Cycloalkyl represents, for example, cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cyc

Alkoxy represents, for example, methoxy, ethoxy, propoxy, isopropoxy, n-(iso-, sec- or tert-)butoxy, n-(iso-, sec-, tert- or neo-)pentoxy, n-(iso-, sec-, tert- or neo-)hexoxy.

Haloalkoxy represents the above mentioned alkoxy groups which are substituted with the same or different halogen atom(s) and is, for example, trifluoromethoxy.

Alkylthio represents, for example, methylthio, ethylthio, propylthio, isopropylthio, n-(iso-, sec- or tert-)butylthio, n-(iso-, sec-, tert- or neo-)pentylthio, n-(iso-, sec-, tert- or neo-)hexylthio.

Among the benzophenone hydrazone derivatives according to the invention, of the formula (I), preferred compounds are those in which

R<sup>1</sup> is halogen,

R<sup>2</sup> is hydrogen or C<sub>1-3</sub> alkyl,

is cyano, C<sub>1.4</sub> alkyl which may be substituted by one or more than one substituent selected from the group consisting of halogen, cyano, methoxy, ethoxy and trimethylsilyl or is C<sub>2.3</sub> alkenyl, propargyl, methyl-carbonyl, methoxy-thiocarbonyl or ethoxy-thiocarbonyl,

R<sup>4</sup> is hydrogen, C<sub>1-4</sub> alkyl, C<sub>2-4</sub> alkenyl, phenyl, or is benzyl, -CO-R<sup>8</sup>, -CO-O-R<sup>9</sup> or

5**5** 

45

50

5

10

15

30

is hydrogen, formyl, phenyl, C<sub>1-6</sub> alkyl which may be substituted by one or more than one substituent selected from the group consisting of halogen, cyano, C<sub>1-4</sub> alkoxy, C<sub>1-4</sub> alkylthio, hydroxycarbonyl, C<sub>1-6</sub> alkoxy-carbonyl, phenyl, which is substituted by halogen and methoxyphenyl or is C<sub>2-6</sub> alkenyl, C<sub>3-6</sub> alkynyl, C<sub>1-6</sub> alkyl-carbonyl, C<sub>1-6</sub> halogenalkyl-carbonyl, C<sub>1-4</sub> alkoxy-C<sub>1-6</sub> alkyl-carbonyl, C<sub>1-6</sub> alkyl-oxalyl, C<sub>1-6</sub> alkoxy-carbonyl which may be substituted by one or more than one substitutent selected from the group consisting of C<sub>3-6</sub> cycloalkyl and C<sub>1-4</sub> alkoxy or is C<sub>1-6</sub> alkoxy-oxalyl, C<sub>3-6</sub> cycloalkyl-carbonyl which may be substituted by C<sub>1-4</sub> alkyl, C<sub>2-6</sub> alkenyl-carbonyl which may be substituted by one or more than one substituent selected from the group consisting of halogen, nitro, cyano, C<sub>1-4</sub> alkoxy and C<sub>1-4</sub> alkylthio,

. 10 R<sup>6</sup> is hydrogen or halogen,

5

30

35

40

R<sup>7</sup> is hydrogen or halogen or C<sub>1-2</sub> alkyl,

n is 0, 1 or 2, provided that n is 0 when R<sup>3</sup> is cyano, methyl-carbonyl, methoxy-thiocarbonyl or ethoxy-thiocarbonyl

is a single bond of Anti form or of Syn form,

is C<sub>1-6</sub> alkyl which may be substituted by one or more than one substituent selected from the group consisting of halogen, cyano, C<sub>1-4</sub> alkoxy, C<sub>1-4</sub> alkoxy-carbonyl and phenoxy or is C<sub>2-6</sub> alkenyl which may be substituted by one or more than one substituent selected from the group consisting of halogen and phenyl, or is phenyl which may be substituted by one or more than one substituent selected from the group consisting of halogen, nitro, cyano, C<sub>1-4</sub> alkyl, C<sub>1-4</sub> alkoxy and C<sub>1-4</sub> alkythio, or is C<sub>3-6</sub> cycloalkyl which may be substituted by C<sub>1-4</sub> alkyl, or is C<sub>1-6</sub> alkyl-carbonyl or C<sub>1-6</sub> alkoxy-carbonyl, or hydrogen,

 $R^9$  is  $C_{1-6}$  alkyl which may be substituted by one or more than one substituent selected from the group consisting of halogen, phenyl, 4-nitrophenyl, trimethylsilyl and  $C_{3-6}$  cycloalkyl, or is  $C_{3-6}$  cycloalkyl, or  $C_{2-6}$  alkenyl which may be substituted by phenyl or is  $C_{3-6}$  alkynyl,

R<sup>10</sup> is hydrogen or C<sub>1-4</sub> alkyl,

is hydrogen, C<sub>1-4</sub> alkyl which may be substituted by halogen or is phenyl which may be substituted by one or more than one substituent selected from the group consisting of halogen, C<sub>1-4</sub> alkoxy or C<sub>1-4</sub> haloalkoxy and is oxygen or sulfur.

Particularly preferred benzophenone hydrazone derivatives of the formula (I) are those in which

R<sup>1</sup> is fluorine, chlorine, bromine or iodine,

R<sup>2</sup> is hydrogen, methyl, ethyl or n-propyl,

is cyano, methyl, ethyl, propyl, isopropyl, n-butyl, sec-butyl, cyanomethyl, fluoromethyl, chloromethyl, difluoromethyl, trifluoromethyl, 2-fluoroethyl, 2-chloroethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, 3-fluoropropyl, 3-chloropropyl, 2,2,3,3-tetrafluoropropyl, methoxymethyl, ethoxymethyl, trimethylsilylmethyl, vinyl, allyl, propargyl, methyl-carbonyl or ethoxy-thiocarbonyl,

R<sup>4</sup> is hydrogen, methyl, ethyl, propyl, isopropyl, n-butyl, tert-butyl, allyl, phenyl, benzyl, -CO-R<sup>8</sup>, -CO-O-R<sup>9</sup> or

is hydrogen, methyl, ethyl, propyl, isopropyl, n-butyl, tert-butyl, n-pentyl, n-hexyl, methoxymethyl, ethoxymethyl, methylthiomethyl, methylthioethyl, methoxycarbonylmethyl, ethoxycarbonylmethyl, 2-ethoxycarbonylethyl, difluoromethyl, 2-chloroethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, cyanomethyl, cyanomethyl, vinyl, allyl, propargyl, phenyl, benzoyl, cinnamoyl, benzyl, 4-chlorobenzoyl, 4-methoxybenzoyl, formyl,methylcarbonyl, ethylcarbonyl, propylcarbonyl, isopropylcarbonyl, n-butylcarbonyl, 2,2,2-trifluoroethylcarbonyl, 5-bromopentylcarbonyl, methoxymethylcarbonyl, methyloxalyl, propyloxalyl, isopropyloxalyl, n-butyl-oxalyl, methoxycarbonyl, ethoxycarbonyl, propoxyoxalyl, butoxycarbonyl, ethoxyoxalyl, propoxyoxalyl, butoxyoxalyl, cyclopropylcarbonyl, 1-methylcyclopropylcarbonyl, cyclopropylmethoxycarbonyl or 2-methoxyethoxycarbonyl, hydroxycarbonylethyl,

R<sup>6</sup> is hydrogen, fluorine or chlorine,

R<sup>7</sup> is hydrogen, bromine or m thyl,

n is 0, 1 or 2, provided that n is 0 when R<sup>3</sup> is methyl-carbonyl or ethoxy-thiocarbonyl,

is a single bond of Anti form or of Syn form,

|            | R <sup>8</sup>                     | is methyl, ethyl, propyl, isopropyl, n-butyl, isobutyl, sec-butyl, tert-butyl, n-pentyl, n-hexyl, cyanomethyl, 2 chloroethyl, 3-chloropropyl, 4-chlorobutyl, m thoxym thyl, 2-methoxyethyl, phenoxymethyl, ethoxycarbonyl methyl, vinyl, isopropenyl, 1-propenyl, 2,3,3-trifluoro-2-propenyl, phenyl, 4-chlorophenyl, 4-bromophenyl, 4 methylphenyl, 4-methoxyphenyl, styryl, cyclopropyl, cyclopentyl, cyclohexyl, 1-methylcyclopropyl, methylcarbonyl, ethylcarbonyl, propylcarbonyl, methoxycarbonyl, ethoxycarbonyl or propyoxcarbonyl, or hydrogen, |
|------------|------------------------------------|--|
| 5          | R <sup>9</sup>                     | is methyl, ethyl, propyl, isopropyl, n-butyl, isobutyl, tert-butyl, sec-butyl, n-pentyl, neo-pentyl, 2-methylbutyl n-hexyl, trimethylsilylmethyl, allyl, cyclopentyl, cyclohexyl, 2-methyl-2-propenyl, propargyl, 2-chloroethyl 2,2,2-trifluoroethyl, 2,2,3,3-tetrafluoropropyl, cyclopropylmethyl, cyclohexylmethyl, benzyl or 4-nitrobenzyl  |
| 10         | R <sup>10</sup><br>R <sup>11</sup> | is hydrogen or methyl, is hydrogen, methyl, ethyl, 2-chloroethyl, phenyl, 2-chlorophenyl, 2-methoxyphenyl or 4-trifluoromethoxyphenyl, and   |
|            | Z .                                | is oxygen or sulfur.   |
| 15         |                                    |  |
| 20         |                                    |  |
|            |                                    |  |
| 25         |                                    |  |
| 30         |                                    |  |
|            |                                    | •  |
| 35         |                                    |  |
| 40         |                                    | -  |
|            |                                    |  |
| 45         |                                    |  |
| 50         |                                    |  |
|            |                                    |  |
| 5 <b>5</b> |                                    |  |
|            |                                    |  |

Specifically mentioned are the following compounds in Table 1 to Table 4.

Table 1

| 5    | O<br>II<br>R <sup>5</sup> N C C C R <sup>9</sup>      |
|------|---|
| . 10 | 7 V   |
|      | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ |
| . 15 | R <sup>1</sup> CH   2 R <sup>2</sup>                  |

|    |                |                |                                   |           |                | ••             |                |                                   |
|----|----------------|----------------|-----------------------------------|-----------|----------------|----------------|----------------|-----------------------------------|
|    | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>                    | <u>n_</u> | R <sup>5</sup> | R <sup>6</sup> | R <sup>7</sup> | _R <sup>9</sup>                   |
|    | F              | Н              | CH₃                               | 0         | н              | н              | Н              | CH <sub>3</sub>                   |
| 20 | F              | Н              | CH <sub>3</sub>                   | 0         | н              | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 20 | F              | Н              | CH3                               | 0         | Н              | 3-F            | н              | CH <sub>3</sub>                   |
|    | F              | Н              | CH <sub>3</sub>                   | 0         | Н              | 3-F            | н              | C <sub>2</sub> H <sub>5</sub>     |
|    | F              | Н              | CH3                               | 1         | Н              | н              | н              | CH <sub>3</sub>                   |
|    | F              | Н              | CH <sub>3</sub>                   | 1         | Н              | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 25 | F              | Н              | CH <sub>3</sub>                   | 1         | Н              | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | F              | Н              | CH <sub>3</sub>                   | 1         | н              | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | F              | Н              | CH₃                               | 1         | Н              | н              | н              | iso-C <sub>4</sub> H <sub>9</sub> |
|    | F              | Н              | CH <sub>3</sub>                   | 1         | H              | н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
| 30 | F              | Н              | CH <sub>3</sub>                   | 2         | Н              | Н              | Н              | C₂H₅                              |
|    | F              | Н              | сн₃                               | 2         | н              | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | F              | Н              | CH <sub>3</sub>                   | 2         | н              | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | F              | Н              | CH <sub>3</sub>                   | 2         | н              | н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
| 35 | F              | Н              | CH <sub>3</sub>                   | 2         | Н              | *H             | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|    | F              | Н              | C <sub>2</sub> H <sub>5</sub>     | 0         | н              | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | F              | Н              | C₂H₅                              | 0         | н              | 3-F            | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | F              | Н              | C <sub>2</sub> H <sub>5</sub>     | 1         | н              | н              | Н              | CH <sub>3</sub>                   |
|    | F              | Н              | C <sub>2</sub> H <sub>5</sub>     | 1         | Н              | Н              | Н              | C₂H <sub>5</sub>                  |
| 40 | F              | Н              | C <sub>2</sub> H <sub>5</sub>     | 1         | Н              | н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|    | F              | Н              | C <sub>2</sub> H <sub>5</sub>     | 1         | н              | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | F              | Н              | C <sub>2</sub> H <sub>5</sub>     | 2         | н              | н              | Н              | CH <sub>3</sub>                   |
|    | F              | Н              | C <sub>2</sub> H <sub>5</sub>     | 2         | Н              | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 45 | F              | Н              | C <sub>2</sub> H <sub>5</sub>     | 2         | Н              | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | F              | H              | C₂H₅                              | 2         | H              | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
|    | F              | Н              | C <sub>2</sub> H <sub>5</sub>     | 2         | Н              | н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|    | F              | Н              | C <sub>2</sub> H <sub>5</sub>     | 2         | н              | 3-F            | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 50 | F              | Н              | CH <sub>2</sub> CH <sub>2</sub> F | 0         | н              | н              | Н              | CH <sub>3</sub>                   |
|    | F              | H              | CH <sub>2</sub> CF <sub>3</sub>   | 0         | н              | н              | Н              | CH₃                               |
|    | F<br>CI        | H              | CH <sub>2</sub> CF <sub>3</sub>   | 0         | Н              | 3-F            | Н              | CH <sub>3</sub>                   |
|    | CI             | Н              | CH <sub>3</sub>                   | 0         | Н              | н              | Н              | CH <sub>3</sub>                   |
|    |                |                |                                   |           |                |                |                |                                   |

55

Table 1 (continued)

| 5              | R <sup>1</sup> R <sup>2</sup> | R <sup>3</sup>  | n | R <sup>5</sup> | R <sup>6</sup> | R <sup>7</sup>    | R <sup>9</sup>  |
|----------------|-------------------------------|-----------------|---|----------------|----------------|-------------------|---|
| 3              |                               |                 |   |                |                | К.                | _ <del>K</del>  |
|                | CI H                          | CH <sub>3</sub> | 0 | н              | н              | н                 | 0.11  |
|                | CI H                          | CH <sub>3</sub> | 0 | <br>Н          | Н              | Н                 | C <sub>2</sub> H <sub>5</sub>                                     |
|                | CI H                          | CH <sub>3</sub> | 0 | н              | Н              |                   | n-C <sub>3</sub> H <sub>7</sub>                                   |
| 10             | CI H                          | CH <sub>3</sub> | 0 | H              |                | Н                 | iso-C <sub>3</sub> H <sub>7</sub>                                 |
|                | CI H                          | CH <sub>3</sub> | 0 | н              | H<br>H         | H                 | sec-C <sub>4</sub> H <sub>9</sub>                                 |
|                | CI H                          | CH <sub>3</sub> | 0 | H              |                | H                 | tert-C <sub>4</sub> H <sub>9</sub>                                |
|                | CI H                          | CH <sub>3</sub> | 0 | H              | н              | H                 | n-C <sub>4</sub> H <sub>9</sub>                                   |
| 15             | CI H                          | CH <sub>3</sub> | 0 | H              | Н              | Н                 | iso-C <sub>4</sub> H <sub>9</sub>                                 |
|                | CI H                          | CH <sub>3</sub> | 0 | Н              | Н              | Н                 | n-C <sub>5</sub> H <sub>11</sub>                                  |
|                | CI H                          | CH <sub>3</sub> | 0 | н              | H              | Н                 | neo-C <sub>5</sub> H <sub>11</sub>                                |
|                | CI H                          | CH <sub>3</sub> | 0 | H              | Н              | Н                 | CH <sub>2</sub> CH(CH <sub>3</sub> )C <sub>2</sub> H <sub>5</sub> |
| 20             | CI H                          | CH <sub>3</sub> | 0 |                | Н              | Н                 | n-C <sub>6</sub> H <sub>13</sub>                                  |
| 20             | CI H                          | CH <sub>3</sub> | 0 | Н              | Н              | Н                 | n-C <sub>7</sub> H <sub>15</sub>                                  |
|                | CI H                          | CH <sub>3</sub> | 0 | H<br>H         | Н              | Н                 | n-C <sub>8</sub> H <sub>17</sub>                                  |
|                | CI H                          | CH <sub>3</sub> | 0 | H              | Н              | Н                 | CH <sub>2</sub> CH≖CH <sub>2</sub>                                |
|                | CI H                          | CH <sub>3</sub> | 0 | Н              | Н              | Н                 | CH <sub>2</sub> C(CH <sub>3</sub> )=CH <sub>2</sub>               |
| 25             | CI H                          | CH <sub>3</sub> | 0 | H              | Н              | Н                 | CH <sub>2</sub> C≡CH  |
|                | CI H                          | CH <sub>3</sub> | 0 | H              | Н              | Н                 | CH₂C <sub>6</sub> H <sub>5</sub>                                  |
|                | CI H                          | CH <sub>3</sub> | 0 | H              | Н              | H                 | CH <sub>2</sub> CF <sub>3</sub>                                   |
|                | CI H                          | CH <sub>3</sub> | 0 | H              | Н              | Н                 | CH <sub>2</sub> CH <sub>2</sub> CI                                |
| 30             | CI H                          | CH <sub>3</sub> | 0 | Н              | Н              | H                 | CH <sub>2</sub> CH <sub>2</sub> OCH <sub>3</sub>                  |
|                |                               | O. 13           | U | П              | Н              | H                 | CH <sub>2</sub> Si(CH <sub>3</sub> ) <sub>3</sub>                 |
|                | CI H                          | CH <sub>3</sub> | 0 | н              | н              | н                 | <b></b>   |
|                |                               | 3               | • | ••             | - 11           | п                 | -a <sup>‡</sup> (`)   |
| 35             | <b>.</b>                      |                 |   |                |                | •                 |   |
| •              | CI H                          | CH <sub>3</sub> | 0 | Н              | Н              | Н                 | <b>-</b> ⟨\)  |
|                |                               |                 |   |                |                |                   |   |
|                | CI H                          | СН <sub>3</sub> | 0 | Н              | Н              | н                 |   |
|                | CI H                          |                 | _ |                |                |                   | $\leftarrow$  |
| 40             |                               | CH <sub>3</sub> | 0 | Н              | Н              | 2-F               | C₂H₅  |
|                |                               | CH <sub>3</sub> | 0 | Н              | Н              | 3-F               | C₂H <sub>5</sub>  |
|                |                               | CH₃             | 0 | H              | Н              | 3-CI              | C₂H₅  |
|                | CI H                          | CH <sub>3</sub> | 0 | H              | Н              | 3-Br              | C₂H₅  |
| 45             |                               | CH <sub>3</sub> | 0 | H              | Н              | 3-CH <sub>3</sub> | C₂H₅  |
|                | CI H                          | CH₃             | 0 | H              | 2-F            | Н                 | CH <sub>3</sub>   |
|                | CI H                          | CH <sub>3</sub> | 0 | H              | 2-F            | Н                 | C₂H₅  |
|                | CIH                           | CH <sub>3</sub> | 0 | н              | 2-CI           |                   | CH <sub>3</sub>   |
| 50             | CI H                          | CH <sub>3</sub> | 0 | Н              | 2-CI           |                   | C <sub>2</sub> H <sub>5</sub>                                     |
| - <del>-</del> | CI H                          | CH <sub>3</sub> | 0 | H              | 3-F            | Н                 | CH₃   |
|                | CI H                          | CH₃<br>CH₃      | 0 | H              | 3-F            |                   | C <sub>2</sub> H <sub>5</sub>                                     |
|                | <b>-</b> , ,,                 | ∪13             | 0 | н              | 3-CI           | Н                 | CH <sub>3</sub>   |
|                |                               |                 |   |                |                |                   |   |

Table 1 (continued)

| 5         | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>  | <u>n</u> | R <sup>5</sup>                                 | R <sup>6</sup> | R <sup>7</sup> | R <sup>9</sup>                    |
|-----------|----------------|----------------|-----------------|----------|--|----------------|----------------|-----------------------------------|
|           | CI             | Н              | CH <sub>3</sub> | 0        | Н  | 3-CI           | Н              | C <sub>2</sub> H <sub>5</sub>     |
|           | CI             | Н              | CH <sub>3</sub> | 0        | CH <sub>3</sub>                                | Н              | Н              | CH <sub>3</sub>                   |
|           | CI             | Н              | CH <sub>3</sub> | 0        | CH <sub>3</sub>                                | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|           | CI             | Н              | CH <sub>3</sub> | 0        | CH <sub>3</sub>                                | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
| 10        | CI             | Н              | CH <sub>3</sub> | 0        | CH <sub>3</sub>                                | Н              | H:             | iso-C <sub>3</sub> H <sub>7</sub> |
|           | CI             | Н              | CH <sub>3</sub> | 0        | CH <sub>3</sub>                                | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|           | CI             | Н              | CH <sub>3</sub> | 0        | C <sub>2</sub> H <sub>5</sub>                  | Н              | Н              | CH <sub>3</sub>                   |
| •         | CI             | Н              | CH <sub>3</sub> | 0        | C <sub>2</sub> H <sub>5</sub>                  | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
| 15        | CI             | Н              | CH <sub>3</sub> | 0        | C <sub>2</sub> H <sub>5</sub>                  | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|           | CI             | н              | CH <sub>3</sub> | 0        | C <sub>2</sub> H <sub>5</sub>                  | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|           | CI             | Н              | CH <sub>3</sub> | 0        | C <sub>2</sub> H <sub>5</sub>                  | Н              | н              | n-C <sub>4</sub> H <sub>9</sub>   |
| -         | CI             | Н              | CH <sub>3</sub> | 0        | C <sub>2</sub> H <sub>5</sub>                  | Н              | Н              | iso-C₄H <sub>9</sub>              |
| 20        | CI             | Н              | CH <sub>3</sub> | 0        | C <sub>2</sub> H <sub>5</sub>                  | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub> |
|           | CI             | Н              | CH₃             | 0        | C <sub>2</sub> H <sub>5</sub>                  | Н              | н              | CH <sub>2</sub> CF <sub>3</sub>   |
|           | CI             | Н              | CH <sub>3</sub> | 0        | n-C <sub>3</sub> H <sub>7</sub>                | н              | Н              | CH <sub>3</sub>                   |
|           | CI             | Н              | CH3             | 0        | n-C <sub>3</sub> H <sub>7</sub>                | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| <i>25</i> | CI             | Н              | CH <sub>3</sub> | 0        | n-C <sub>3</sub> H <sub>7</sub>                | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
| 25        | CI             | Н              | CH <sub>3</sub> | 0        | n-C <sub>3</sub> H <sub>7</sub>                | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|           | CI             | Н              | CH <sub>3</sub> | 0        | n-C <sub>3</sub> H <sub>7</sub>                | н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|           | CI             | Н              | CH <sub>3</sub> | 0        | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | CH <sub>3</sub>                   |
|           | CI             | Н              | CH <sub>3</sub> | 0        | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 30        | CI             | Н              | CH <sub>3</sub> | 0        | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|           | CI             | Н              | CH <sub>3</sub> | 0        | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|           | CI             | Н              | CH <sub>3</sub> | 0        | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | n-C₄H <sub>9</sub>                |
|           | CI             | Н              | CH <sub>3</sub> | 0        | iso-C <sub>3</sub> H <sub>7</sub>              | , H            | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
| 35        | CI             | Н              | CH <sub>3</sub> | 0        | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub> |
|           | CI             | Н              | CH <sub>3</sub> | Ō        | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|           | CI             | Н              | CH <sub>3</sub> | 0        | n-C <sub>4</sub> H <sub>9</sub>                | Н              | Н              | CH <sub>3</sub>                   |
|           | CI             | н              | CH <sub>3</sub> | 0        | n-C₄H <sub>9</sub>                             | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 40        | CI             | Н              | CH <sub>3</sub> | 0        | n-C <sub>4</sub> H <sub>9</sub>                | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
| ,         | CI             | Н              | CH <sub>3</sub> | 0        | n-C <sub>4</sub> H <sub>9</sub>                | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|           | CI             | Н              | CH <sub>3</sub> | 0        | CHF <sub>2</sub>                               | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|           | CI             | Н              | CH <sub>3</sub> | 0        | CH₂OCH₃  | Н              | Н              | CH₃                               |
|           | CI             | н              | CH <sub>3</sub> | 0        | CH2OCH3  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 45        | CI             | н              | CH₃             | 0        | CH <sub>2</sub> OCH <sub>3</sub>               | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|           | CI             | Н              | CH <sub>3</sub> | 0        | CH <sub>2</sub> OCH <sub>3</sub>               | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|           | CI             | H              | CH <sub>3</sub> | 0        | CH <sub>2</sub> OCH <sub>3</sub>               | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|           | CI             | Н              | CH3             | 0        | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | н              | Н              | CH <sub>3</sub>                   |
| 50        | CI             | H              | CH <sub>3</sub> | 0        | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|           | CI             | Н              | CH <sub>3</sub> | 0        | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|           | CI             | н              | CH₃             | 0        | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |

Table 1 (continued)

| 5  |   | <u>R</u> 1 | R <sup>2</sup> | R <sup>3</sup>  | <u>n</u> | R <sup>5</sup>   | R <sup>6</sup> | R <sup>7</sup> | R <sup>9</sup>                    |
|----|---|------------|----------------|-----------------|----------|--|----------------|----------------|-----------------------------------|
|    |   | CI         | Н              | CH₃             | 0        | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub>                   | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|    |   | CI         | Н              | CH <sub>3</sub> | 0        | CH <sub>2</sub> SCH <sub>3</sub>                                 | Н              | Н              | CH <sub>3</sub>                   |
|    |   | CI         | Н              | CH <sub>3</sub> | 0        | CH₂SCH₃  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 10 |   | CI         | Н              | CH₃             | 0        | CH <sub>2</sub> SCH <sub>3</sub>                                 | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    |   | CI         | H.             | CH <sub>3</sub> | 0        | CH <sub>2</sub> SCH <sub>3</sub>                                 | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    |   | CI         | Н              | CH <sub>3</sub> | 0        | CH <sub>2</sub> SCH <sub>3</sub>                                 | Н              | н              | CH <sub>2</sub> CF <sub>3</sub>   |
|    |   | CI         | Н              | CH <sub>3</sub> | 0        | CH <sub>2</sub> C <sub>6</sub> H <sub>5</sub>                    | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 15 |   | CI         | Н              | СН <sub>3</sub> | 0 .      | CH <sub>2</sub> CO2C <sub>2</sub> H <sub>5</sub>                 | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
| 73 |   | CI         | Н              | CH <sub>3</sub> | 0        | CH <sub>2</sub> CH <sub>2</sub> CO2C <sub>2</sub> H <sub>5</sub> | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    |   | CI         | Н              | CH3             | 0        | СНО  | Н              | н              | CH <sub>3</sub>                   |
|    |   | CI         | Н              | CH <sub>3</sub> | 0        | СНО  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    |   | CI         | Н              | CH <sub>3</sub> | 0        | COCH <sub>3</sub>  | Н              | Н              | CH <sub>3</sub>                   |
| 20 |   | CI         | Н              | CH <sub>3</sub> | 0        | COCH <sub>3</sub>  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    |   | CI         | Н              | CH <sub>3</sub> | 0        | COCH3  | Н              | н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    |   | CI         | Н              | CH <sub>3</sub> | 0        | COCH3  | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    |   | CI         | Н              | CH <sub>3</sub> | 0        | COC <sub>2</sub> H <sub>5</sub>                                  | Н              | н              | CH <sub>3</sub>                   |
| 25 |   | CI         | Н              | CH <sub>3</sub> | 0        | COC <sub>2</sub> H <sub>5</sub>                                  | Н              | н              | C₂H₅                              |
|    |   | CI         | Н              | CH <sub>3</sub> | 0        | COC <sub>2</sub> H <sub>5</sub>                                  | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    |   | CI         | Н              | CH <sub>3</sub> | 0        | COC <sub>2</sub> H <sub>5</sub>                                  | Н              | н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    |   | CI         | Н              | CH <sub>3</sub> | 0        | COC <sub>2</sub> H <sub>5</sub>                                  | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
| 30 |   | CI         | Н              | CH₃             | 0        | COC <sub>3</sub> H <sub>7</sub> -n                               | Н              | Н              | CH <sub>3</sub>                   |
|    |   | CI         | Н              | СН₃             | 0        | COC <sub>3</sub> H <sub>7</sub> -n                               | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    |   | CI         | Н              | CH <sub>3</sub> | 0        | COC <sub>3</sub> H <sub>7</sub> -n                               | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    |   | CI         | Н              | CH <sub>3</sub> | 0        | COC <sub>3</sub> H <sub>7</sub> -n                               | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
| 35 |   | CI         | Н              | CH <sub>3</sub> | 0        | COC <sub>3</sub> H <sub>7</sub> -n                               | Ĥ              | Н              | n-C <sub>4</sub> H <sub>9</sub>   |
|    |   | CI         | Н              | CH <sub>3</sub> | 0        | COC <sub>3</sub> H <sub>7</sub> -n                               | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub> |
|    |   | CI         | Н              | CH <sub>3</sub> | 0        | COC <sub>3</sub> H <sub>7</sub> -n                               | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
|    |   | CI         | н              | CH <sub>3</sub> | 0        | COC <sub>3</sub> H <sub>7</sub> -n                               | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
| 40 |   | CI         | Н              | CH <sub>3</sub> | 0        | COC <sub>3</sub> H <sub>7</sub> -iso                             | Н              | Н              | CH <sub>3</sub>                   |
|    | * | CI         | н              | CH <sub>3</sub> | 0        | COC <sub>3</sub> H <sub>7</sub> -iso                             | н              | Н              | C₂H₅                              |
|    |   | CI         | Н              | CH <sub>3</sub> | 0        | COC <sub>3</sub> H <sub>7</sub> -iso                             | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    |   | CI         | Н              | CH <sub>3</sub> | 0        | COC <sub>4</sub> H <sub>9</sub> -n                               | Н              | Н              | CH <sub>3</sub>                   |
| 45 |   | CI         | н              | CH <sub>3</sub> | 0        | COC <sub>4</sub> H <sub>9</sub> -n                               | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 45 |   | CI         | Н              | CH <sub>3</sub> | 0        | COC <sub>4</sub> H <sub>9</sub> -n                               | Н              | н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    |   | CI         | н              | CH <sub>3</sub> | 0        | COC <sub>4</sub> H <sub>9</sub> -n                               | н              | н              | iso-C <sub>3</sub> H <sub>7</sub> |
| 50 |   | CI         | н              | CH₃             | 0        | o<br>"-C   | н              | н              | CH <sub>3</sub>                   |
|    |   | CI         | н              | CH <sub>3</sub> | 0        | -c- <del>-</del> -   | н              | н              | C₂H₅                              |

Table 1 (continued)

|           | <u>R</u> 1 | R <sup>2</sup> | R <sup>3</sup>  | n | R <sup>5</sup>                       | R <sup>6</sup> | R <sup>7</sup> | R <sup>9</sup>                     |
|-----------|------------|----------------|-----------------|---|--------------------------------------|----------------|----------------|------------------------------------|
| 5         | CI         | н              | CH <sub>3</sub> | 0 | 0<br>-C                              | н              | н              | n-C <sub>3</sub> H <sub>7</sub>    |
|           | CI         | н              | CH <sub>3</sub> | 0 | O OH,                                | н              | н              | C <sub>2</sub> H <sub>5</sub>      |
| 10        | CI         | Н              | CH₃             | 0 | COC <sub>6</sub> H <sub>5</sub>      | н              | н              | СН₃                                |
|           | CI         | Н              | CH <sub>3</sub> | 0 | COC <sub>6</sub> H <sub>5</sub>      | н              | Н              | C <sub>2</sub> H <sub>5</sub>      |
|           | CI         | Н              | CH <sub>3</sub> | 0 | COC <sub>6</sub> H <sub>5</sub>      | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
| •         | CI.        | Н              | CH,             | 0 | COC <sub>8</sub> H <sub>5</sub>      | Н              | н              | iso-C <sub>3</sub> H <sub>7</sub>  |
| 15        | CI         | Н              | CH <sub>3</sub> | 0 | COC <sub>6</sub> H₅                  | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>    |
|           | CI         | н              | CH <sub>3</sub> | 0 | 0<br>  <br>-c-⟨_}-cı                 | н              | н              | C <sub>2</sub> H <sub>5</sub>      |
| 20        | CI         | н              | CH3             | 0 | -¢-{_}-œ <b>-</b> ţ                  | н              | н              | C <sub>2</sub> H <sub>5</sub>      |
|           | CI         | Н              | CH₃             | 0 | COCH=CHC <sub>6</sub> H <sub>5</sub> | н              | н              | C <sub>2</sub> H <sub>5</sub>      |
|           | CI         | Н              | сн₃             | 0 | COCHZOCH3                            | Н              | н              | CH <sub>3</sub>                    |
| <i>25</i> | CI         | Н              | сн₃             | 0 | COCH <sub>2</sub> OCH <sub>3</sub>   | Н              | н              | C <sub>2</sub> H <sub>5</sub>      |
|           | CI         | Н              | СН₃             | 0 | COCH <sub>2</sub> OCH <sub>3</sub>   | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
|           | CI         | Н              | сн₃             | 1 | н                                    | Н              | Н              | CH <sub>3</sub>                    |
|           | CI         | Н              | сн₃             | 1 | Н                                    | Н              | Н              | C₂H₅                               |
|           | CI         | Н              | сн₃             | 1 | Н                                    | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
| 30        | CI         | Н              | сн₃             | 1 | н                                    | Н              | н              | iso-C <sub>3</sub> H <sub>7</sub>  |
|           | CI         | Н              | сн₃             | 1 | Н                                    | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>    |
|           | CI         | Н              | CH₃             | 1 | н                                    | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>  |
|           | CI         | Н              | CH₃             | 1 | Н                                    | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
| 35        | CI         | Н              | CH₃             | 1 | н                                    | 2-CI           | Н              | C <sub>2</sub> H <sub>5</sub>      |
|           | CI         | н              | CH₃             | 1 | Н                                    | 2-F            | Н              | C <sub>2</sub> H <sub>5</sub>      |
|           | CI         | Н              | CH <sub>3</sub> | 1 | Н                                    | 3-F            | Н              | C <sub>2</sub> H <sub>5</sub>      |
|           | CI         | Н              | CH <sub>3</sub> | 1 | Н                                    | 3-CI           | Н              | C <sub>2</sub> H <sub>5</sub>      |
| 40        | CI         | Н              | CH <sub>3</sub> | 1 | СН₃                                  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>      |
| *         | CI         | Н              | CH <sub>3</sub> | 1 | C <sub>2</sub> H <sub>5</sub>        | Н              | Н              | C <sub>2</sub> H <sub>5</sub>      |
|           | CI         | Н              | CH <sub>3</sub> | 1 | C <sub>2</sub> H <sub>5</sub>        | н              | Н              | CH <sub>2</sub> CF <sub>3</sub>    |
|           | CI         | Н              | CH₃             | 1 | C₂H₅                                 | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
|           | CI         | Н              | CH <sub>3</sub> | 1 | C <sub>2</sub> H <sub>5</sub>        | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>    |
| 45        | CI         | Н              | CH₃             | 1 | C <sub>2</sub> H <sub>5</sub>        | Н              | Н              | sec-C <sub>4</sub> H <sub>g</sub>  |
|           | CI         | Н              | CH3             | 1 | C <sub>2</sub> H <sub>5</sub>        | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>  |
|           | CI         | Н              | CH3             | 1 | C <sub>2</sub> H <sub>5</sub>        | Н              | Н              | CH <sub>3</sub>                    |
|           | CI         | Н              | CH3             | 1 | C <sub>2</sub> H <sub>5</sub>        | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>  |
| 50        | CI         | Н              | CH3             | 1 | iso-C <sub>3</sub> H <sub>7</sub>    | Н              | Н              | CH <sub>3</sub>                    |
|           | CI         | Н              | CH <sub>3</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub>    | н              | Н              | C <sub>2</sub> H <sub>5</sub>      |
|           | CI         | Н              | CH3             | 1 | iso-C <sub>3</sub> H <sub>7</sub>    | Н              | н              | n-C <sub>3</sub> H <sub>7</sub>    |

Table 1 (continued)

| 5  |    | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>  | n | R <sup>5</sup>                                 | R <sup>6</sup> | R <sup>7</sup> | R <sup>9</sup>                    |
|----|----|----------------|----------------|-----------------|---|--|----------------|----------------|-----------------------------------|
|    |    | CI             | Н              | CH <sub>3</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    |    | CI             | Н              | CH3             | 1 | CH2OCH3  | Н              | Н              | CH <sub>3</sub>                   |
|    |    | CI             | Н              | CH₃             | 1 | CH <sub>2</sub> OCH <sub>3</sub>               | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
| 10 |    | CI             | Н              | CH₃             | 1 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | н              | CH <sub>3</sub>                   |
| ,, |    | CI             | Н              | CH <sub>3</sub> | 1 |  | - H            | н              | C <sub>2</sub> H <sub>5</sub>     |
|    |    | CI             | н              | CH <sub>3</sub> | 1 | CH <sub>2</sub> SCH <sub>3</sub>               | Н              | н              | CH <sub>3</sub>                   |
|    |    | CI             | Н              | CH <sub>3</sub> | 1 | CH <sub>2</sub> SCH <sub>3</sub>               | н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|    |    | CI             | н              | CH3             | 1 | сосн   | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 15 |    | CI             | Н              | CH₃             | 1 | COC <sub>2</sub> H <sub>5</sub>                | н              | н              | CH <sub>3</sub>                   |
|    |    | CI             | Н              | CH <sub>3</sub> | 1 | COC <sub>2</sub> H <sub>5</sub>                | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|    |    | CI             | н              | CH <sub>3</sub> | 1 | COC <sub>2</sub> H <sub>5</sub>                | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    |    | CI             | н              | CH <sub>3</sub> | 1 | COC <sub>2</sub> H <sub>5</sub>                | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
| 20 |    | CI             | н              | CH <sub>3</sub> | 1 | COC <sub>3</sub> H <sub>7</sub> -n             | Н              | н              | CH <sub>3</sub>                   |
|    |    | CI             | Н              | CH <sub>3</sub> | 1 | COC <sub>3</sub> H <sub>7</sub> -n             | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    |    | CI             | Н              | CH <sub>3</sub> | 1 | COC <sub>3</sub> H <sub>7</sub> -n             | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    |    | CI             | Н              | CH <sub>3</sub> | 1 | COC <sub>3</sub> H <sub>7</sub> -n             | н              | н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    |    | CI             | н              | сн₃             | 1 | COC <sub>3</sub> H <sub>7</sub> -iso           | Н              | н              | CH <sub>3</sub>                   |
| 25 |    | CI             | Н              | CH <sub>3</sub> | 1 | COC <sub>3</sub> H <sub>7</sub> -iso           | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|    |    | CI             | н              | снз             | 1 | COC <sub>3</sub> H <sub>7</sub> -iso           | Н              | н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    |    | CI             | Н              | CH <sub>3</sub> | 1 | COC <sub>3</sub> H <sub>7</sub> -iso           | Н              | н              | iso-C <sub>3</sub> H <sub>7</sub> |
| 30 |    | CI             | н              | CH <sub>3</sub> | 1 | 0<br>-c  | н              | н              | CH <sub>3</sub>                   |
|    |    | CI             | Н              | CH3             | 1 | -c>  | н              | н              | n-C <sub>3</sub> H <sub>7</sub>   |
| 35 |    | CI             | Н              | CH3             | 1 | 0=0  | н              | н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    |    | Cl             | Н              | CH3             | 1 | o = -  | н              | н              | C <sub>2</sub> H <sub>5</sub>     |
| 40 | •• | CI             | Н              | CH <sub>3</sub> | 1 | COC <sub>6</sub> H <sub>5</sub>                | н              | ш              | <b>C</b> U                        |
|    |    | CI             | Н              | CH <sub>3</sub> | 1 | COC <sub>8</sub> H <sub>5</sub>                | Н              | Н              | CH <sub>3</sub>                   |
|    |    | CI             | н              | CH <sub>3</sub> | 1 | COC <sub>6</sub> H <sub>5</sub>                | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    |    | CI             | Н              | CH <sub>3</sub> | 1 | COC <sub>8</sub> H <sub>5</sub>                | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
| 45 |    | CI             | Н              | CH <sub>3</sub> | 1 |  | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    |    | CI             | Н              | CH <sub>3</sub> | 1 | COCHZOCH3                                      | Н              | H              | CH <sub>3</sub>                   |
|    |    | CI             | Н              | CH <sub>3</sub> | 1 | COCH <sub>2</sub> OCH <sub>3</sub>             | Н              |                | C₂H₅                              |
|    |    | CI             | Н              | CH <sub>3</sub> | 2 | H  |                | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    |    | CI             | н              | CH <sub>3</sub> | 2 | Н  | Н              | Н              | CH <sub>3</sub>                   |
| 50 |    | CI             | н              | CH <sub>3</sub> | 2 | л<br>Н   | Н              | Н              | C₂H₅                              |
|    |    | CI             | н              | CH <sub>3</sub> | 2 | H  | Н              | н              | CH <sub>2</sub> CF <sub>3</sub>   |
|    |    |                | •••            | <b>∵</b> '3     | 2 | п  | Н              | н              | n-C <sub>3</sub> H <sub>7</sub>   |

Tabl 1 (continued)

| 5         | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>  | n | R <sup>5</sup>                                 | R <sup>6</sup> | R <sup>7</sup> | R <sup>9</sup>                     |
|-----------|----------------|----------------|-----------------|---|--|----------------|----------------|------------------------------------|
|           | CI             | Н              | CH₃             | 2 | Н  | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>  |
|           | CI             | Н              | CH₃             | 2 | Н  | Н              | Н              | iso-C₄H <sub>9</sub>               |
|           | CI             | Н              | CH₃             | 2 | Н  | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>  |
| 10        | CI             | Н              | CH₃             | 2 | Н  | н              | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
|           | CI             | Н              | CH₃             | 2 | CH <sub>3</sub>                                | Н              | Н              | C <sub>2</sub> H <sub>5</sub>      |
|           | CI             | Н              | CH₃             | 2 | C <sub>2</sub> H <sub>5</sub>                  | Н              | Н              | CH <sub>3</sub>                    |
|           | CI             | Н              | CH <sub>3</sub> | 2 | C <sub>2</sub> H <sub>5</sub>                  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>      |
| 15        | CI             | Н              | CH <sub>3</sub> | 2 | C <sub>2</sub> H <sub>5</sub>                  | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
|           | CI             | Н              | CH <sub>3</sub> | 2 | C <sub>2</sub> H <sub>5</sub>                  | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>  |
|           | CI             | Н              | CH <sub>3</sub> | 2 | C <sub>2</sub> H <sub>5</sub>                  | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>    |
|           | CI             | Н              | CH₃             | 2 | C <sub>2</sub> H <sub>5</sub>                  | Н              | Н              | iso-C₄H <sub>9</sub>               |
| 20        | CI             | Н              | CH <sub>3</sub> | 2 | C <sub>2</sub> H <sub>5</sub>                  | Н              | Н              | sec-C₄H <sub>9</sub>               |
|           | CI             | Н              | CH <sub>3</sub> | 2 | C <sub>2</sub> H <sub>5</sub>                  | н              | Н              | CH <sub>2</sub> CF <sub>3</sub>    |
|           | CI             | Н              | CH <sub>3</sub> | 2 | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | CH <sub>3</sub>                    |
|           | CI             | Н              | CH <sub>3</sub> | 2 | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | C <sub>2</sub> H <sub>5</sub>      |
| 25        | CI             | Н              | CH <sub>3</sub> | 2 | iso-C <sub>3</sub> H <sub>7</sub>              | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
| 25        | CI             | H              | CH <sub>3</sub> | 2 | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>  |
|           | CI             | Н              | CH <sub>3</sub> | 2 | CH <sub>2</sub> OCH <sub>3</sub>               | Н              | Н              | CH <sub>3</sub>                    |
|           | CI             | Н              | CH <sub>3</sub> | 2 | CH <sub>2</sub> OCH <sub>3</sub>               | н              | Н              | C <sub>2</sub> H <sub>5</sub>      |
| 30        | CI             | Н              | CH <sub>3</sub> | 2 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | н              | Н              | CH <sub>3</sub>                    |
| 30        | CI             | Н              | CH₃             | 2 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | C <sub>2</sub> H <sub>5</sub>      |
|           | CI             | Н              | CH <sub>3</sub> | 2 | CH₂SCH₃  | Н              | Н              | CH₃                                |
|           | CI             | Н              | CH <sub>3</sub> | 2 | CH <sub>2</sub> SCH <sub>3</sub>               | н              | Н              | C <sub>2</sub> H <sub>5</sub>      |
| <i>35</i> | CI             | Н              | CH <sub>3</sub> | 2 | COCH <sub>3</sub>                              | * H            | Н              | C <sub>2</sub> H <sub>5</sub>      |
| 39        | CI             | Н              | CH <sub>3</sub> | 2 | COC <sub>2</sub> H <sub>5</sub>                | Н              | Н              | CH <sub>3</sub>                    |
|           | CI             | Н              | CH <sub>3</sub> | 2 | COC <sub>2</sub> H <sub>5</sub>                | Н              | Н              | C <sub>2</sub> H <sub>5</sub>      |
|           | CI             | Н              | CH₃             | 2 | COC <sub>2</sub> H <sub>5</sub>                | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
| 40        | CI             | Н              | CH <sub>3</sub> | 2 | COC₂H₅   | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>  |
| 40        | CI             | Н              | CH <sub>3</sub> | 2 | COC <sub>3</sub> H <sub>7</sub> -n             | Н              | Н              | C₂H₅                               |
|           | CI             | Н              | CH <sub>3</sub> | 2 | COC <sub>3</sub> H <sub>7</sub> -n             | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
|           | CI             | Н              | CH₃             | 2 | COC <sub>3</sub> H <sub>7</sub> -n             | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>  |
|           | CI             | Н              | CH <sub>3</sub> | 2 | COC <sub>3</sub> H <sub>7</sub> -n             | н              | Н              | CH <sub>3</sub>                    |
| 45        | CI             | Н              | CH₃             | 2 | COC <sub>3</sub> H <sub>7</sub> -iso           | Н              | Н              | CH₃                                |
|           | CI             | Н              | CH <sub>3</sub> | 2 | COC <sub>3</sub> H <sub>7</sub> -iso           | н              | Н              | C <sub>2</sub> H <sub>5</sub>      |
|           | CI             | Н              | CH <sub>3</sub> | 2 | COC <sub>3</sub> H <sub>7</sub> -iso           | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
|           | CI             | Н              | CH₃             | 2 | COC <sub>3</sub> H <sub>7</sub> -iso           | Н              | н              | iso-C <sub>3</sub> H <sub>7</sub>  |
| 50        | CI             | н              | CH <sub>3</sub> | 2 | O<br>"'  | н              | н              | CH <sub>3</sub>                    |

Table 1 (continued)

|             | R <sup>1</sup> R <sup>2</sup> | R <sup>3</sup>                | n R <sup>5</sup> |                                 | <u>8</u> 6 R | 7 R <sup>9</sup>                    |
|-------------|-------------------------------|-------------------------------|------------------|---------------------------------|--------------|-------------------------------------|
| 5           | CI H                          | CH <sub>3</sub>               | 2 .              | 0<br>-C                         | н н          | C <sub>2</sub> H <sub>5</sub>       |
|             | сі н                          | сн₃                           | 2 .              | O<br>-C                         | н н          | n-C <sub>3</sub> H <sub>7</sub>     |
| 10          | сі н                          | CH <sub>3</sub>               | 2 _              | о<br>                           | н н          | iso-C <sub>3</sub> H <sub>7</sub>   |
| 15          | сі н                          | CH <sub>3</sub>               | 2 CC             | C <sub>6</sub> H <sub>5</sub> ∤ | н н          | CH <sub>3</sub>                     |
|             | CI H                          | CH <sub>3</sub>               |                  |                                 | 1 н          |                                     |
|             | CI H                          | CH <sub>3</sub>               | 2 CC             |                                 | н н          |                                     |
|             | .CI H                         | CH <sub>3</sub>               |                  |                                 | + н          |                                     |
| 20          | CI H                          | CH <sub>3</sub>               |                  |                                 | н н          | <b>3</b> /                          |
|             | CI H                          | CH <sub>3</sub>               |                  |                                 | н н          |                                     |
|             | CI H                          | CH <sub>3</sub>               |                  | -                               | 4 F          |                                     |
|             | CI H                          | C <sub>2</sub> H <sub>5</sub> | 0 н              |                                 | 4 F          |                                     |
|             | CI H                          | C <sub>2</sub> H <sub>5</sub> | 0 H              |                                 | 4 F          |                                     |
| 25          | CI H                          | C <sub>2</sub> H <sub>5</sub> | 0 Н              |                                 | H F          | 2 3                                 |
|             | CI H                          | C <sub>2</sub> H <sub>5</sub> | 0 Н              |                                 | н н          |                                     |
|             | CI H                          | C <sub>2</sub> H <sub>5</sub> | 0 Н              | 1                               | н н          |                                     |
|             | CI H                          | C <sub>2</sub> H <sub>5</sub> | 0 Н              | 1                               | н н          |                                     |
| 30          | CI H                          | C <sub>2</sub> H <sub>5</sub> | 0 Н              | 1                               | н н          |                                     |
|             | CI H                          | C <sub>2</sub> H <sub>5</sub> | 0 н              | 1                               | н н          |                                     |
|             | CI H                          | C <sub>2</sub> H <sub>5</sub> | 0 Н              | i                               | н н          |                                     |
|             | CI H                          | C <sub>2</sub> H <sub>5</sub> | 0 H              | 1                               | н            |                                     |
| 35          | CI H                          | C <sub>2</sub> H <sub>5</sub> | 0 H              |                                 | 2-F H        |                                     |
|             | CI H                          | C <sub>2</sub> H <sub>5</sub> | 0 H              | ;                               | 3-F H        |                                     |
|             | CI H                          | C <sub>2</sub> H <sub>5</sub> | 0 H              | :                               | 2-CI +       |                                     |
|             | CI H                          | C <sub>2</sub> H <sub>5</sub> | 0 H              | :                               | 3-CI +       |                                     |
| 40 ~        | CI H                          | C₂H₅                          | 0 C              | H <sub>3</sub>                  | н н          |                                     |
| <del></del> | CI H                          | C₂H₅                          |                  |                                 | н н          | H C <sub>2</sub> H <sub>5</sub>     |
|             | CI H                          | C <sub>2</sub> H <sub>5</sub> |                  |                                 | H I          | H n-C <sub>3</sub> H <sub>7</sub>   |
|             | CI H                          | C₂H₅                          |                  |                                 | н і          | iso-C <sub>3</sub> H <sub>7</sub>   |
|             | CI H                          | C₂H₅                          |                  |                                 | н і          | H CH <sub>3</sub>                   |
| 45          | CI H                          | C₂H₅                          | 0 C              | <sub>2</sub> H <sub>5</sub>     | H I          | H C <sub>2</sub> H <sub>5</sub>     |
|             | CI H                          | C₂H₅                          |                  |                                 | H I          | H n-C <sub>3</sub> H <sub>7</sub>   |
|             | CI H                          | C <sub>2</sub> H <sub>5</sub> |                  |                                 | н і          | H iso-C <sub>3</sub> H <sub>7</sub> |
|             | CI H                          | C₂H₅                          |                  |                                 | н і          | H n-C <sub>4</sub> H <sub>9</sub>   |
| 50          | CI H                          | C₂H₅                          |                  | 2 9                             | H I          | H iso-C <sub>4</sub> H <sub>9</sub> |
|             | CI H                          | C₂H₅                          |                  | 4 9                             | H I          | H sec-C₄H <sub>9</sub>              |
|             | CI H                          | C <sub>2</sub> H <sub>5</sub> | 0 C              | <sub>2</sub> H <sub>5</sub>     | н            | H CH <sub>2</sub> CF <sub>3</sub>   |

Table 1 (continued)

| 5          | $R^1$ $R^2$ | R <sup>3</sup>                | n | R <sup>5</sup>                                 | R <sup>6</sup> | R <sup>7</sup> | R <sup>9</sup>   |
|------------|-------------|-------------------------------|---|--|----------------|----------------|--|
| J          | СІН         | C <sub>2</sub> H <sub>5</sub> | 0 | n-C <sub>3</sub> H <sub>7</sub>                | Н              | H              | CH <sub>3</sub>  |
|            | СІН         | C <sub>2</sub> H <sub>5</sub> | 0 | n-C <sub>3</sub> H <sub>7</sub>                | н              | Н              | C <sub>2</sub> H <sub>5</sub>                          |
|            | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | n-C <sub>3</sub> H <sub>7</sub>                | н              | н              | °2′ '5<br>n-C <sub>3</sub> H <sub>7</sub>              |
|            | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | n-C <sub>3</sub> H <sub>7</sub>                | н              | н              | iso-C <sub>3</sub> H <sub>7</sub>                      |
| 10         | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub>              | H              | H              | CH <sub>3</sub>  |
|            | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub>              | н              | н              | C <sub>2</sub> H <sub>5</sub>                          |
|            | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | н              | 0 <sub>2</sub> . ₁₅<br>n-C <sub>3</sub> H <sub>7</sub> |
| •          | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | н              | iso-C <sub>3</sub> H <sub>7</sub>                      |
| 15         | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub>              | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                        |
|            | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub>              | н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                      |
|            | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub>              | н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>                      |
|            | CIH         | C <sub>2</sub> H <sub>5</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub>              | н              | н              | CH <sub>2</sub> CF <sub>3</sub>                        |
| 20         | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | n-C <sub>4</sub> H <sub>9</sub>                | н              | Н              | CH <sub>3</sub>  |
|            | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | n-C <sub>4</sub> H <sub>9</sub>                | н              | Н              | C <sub>z</sub> H <sub>5</sub>                          |
|            | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | n-C <sub>4</sub> H <sub>9</sub>                | н              | н              | n-C <sub>3</sub> H <sub>7</sub>                        |
|            | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | n-C <sub>4</sub> H <sub>9</sub>                | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                      |
| <i>2</i> 5 | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | CH <sub>2</sub> OCH <sub>3</sub>               | н              | н              | CH <sub>3</sub>  |
| 25         | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | CH <sub>2</sub> OCH <sub>3</sub>               | н              | Н              | C₂H₅   |
|            | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | CH <sub>2</sub> OCH <sub>3</sub>               | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                        |
|            | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | CH <sub>2</sub> OCH <sub>3</sub>               | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                      |
|            | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | CH <sub>2</sub> OCH <sub>3</sub>               | н              | Н              | CH <sub>2</sub> CF <sub>3</sub>                        |
| 30         | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | CH2OC2H5                                       | н              | Н              | CH <sub>3</sub>  |
|            | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | н              | Н              | C₂H₅   |
|            | CI H        | C₂H₅                          | 0 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                        |
|            | CI H        | C₂H₅                          | 0 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                      |
| 35         | CI H        | C₂H₅                          | 0 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | T H            | Н              | CH <sub>2</sub> CF <sub>3</sub>                        |
|            | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | CH₂SCH₃  | Н              | Н              | CH <sub>3</sub>  |
|            | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | CH₂SCH₃  | Н              | Н              | C₂H₅   |
|            | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | CH₂SCH₃  | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                        |
| 40         | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | CH₂SCH₃  | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                      |
| *          | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | CH₂SCH₃  | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>                        |
|            | CI H        | C₂H₅                          | 0 | СНО  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                          |
|            | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | COCH3  | Н              | Н              | CH <sub>3</sub>  |
| 15         | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | COCH3  | н              | Н              | C <sub>2</sub> H <sub>5</sub>                          |
| 45         | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | COCH3  | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                        |
|            | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | COC₂H₅   | Н              | Н              | CH <sub>3</sub>  |
|            | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | COC <sub>2</sub> H <sub>5</sub>                | н              | Н              | C <sub>2</sub> H <sub>5</sub>                          |
|            | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | COC₂H₅   | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                        |
| 50         | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | COC <sub>2</sub> H <sub>5</sub>                | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                      |
|            | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | COC <sub>2</sub> H <sub>5</sub>                | н              | Н              | CH <sub>2</sub> CF <sub>3</sub>                        |
|            | CI H        | C <sub>2</sub> H <sub>5</sub> | 0 | COC <sub>3</sub> H <sub>7</sub> -n             | Н              | Н              | CH <sub>3</sub>  |

Table 1 (continued)

| 5   | $R^1$ $R^2$ | R <sup>3</sup>                | n_ | R <sup>5</sup>                       | R <sup>6</sup> | R <sup>7</sup> | R <sup>9</sup>   |
|-----|-------------|-------------------------------|----|--------------------------------------|----------------|----------------|--|
|     | CI H        | C <sub>2</sub> H <sub>5</sub> | 0  | COC <sub>3</sub> H <sub>7</sub> -n   | н              | Н              | C <sub>2</sub> H <sub>5</sub>  |
|     | CI H        | C <sub>2</sub> H <sub>5</sub> | 0  | COC <sub>3</sub> H <sub>7</sub> -n   | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                                      |
|     | CI H        | C <sub>2</sub> H <sub>5</sub> | 0  | COC <sub>3</sub> H <sub>7</sub> -n   | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                                    |
| 10  | CI H        | C <sub>2</sub> H <sub>5</sub> | 0  | COC <sub>3</sub> H <sub>7</sub> -n   | Н              | Н              | n-C₄H <sub>9</sub>   |
| ,,, | CI H        | C <sub>2</sub> H <sub>5</sub> | 0  | COC <sub>3</sub> H <sub>7</sub> -n   | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                                    |
|     | CI H        | C <sub>2</sub> H <sub>5</sub> | 0  | COC <sub>3</sub> H <sub>7</sub> -n   | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>                                    |
|     | CI H        | C <sub>2</sub> H <sub>5</sub> | 0  | COC <sub>3</sub> H <sub>7</sub> -n   | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>                                      |
| •   | CI H        | C <sub>2</sub> H <sub>5</sub> | 0  | COC <sub>3</sub> H <sub>7</sub> -iso | Н              | Н              | CH <sub>3</sub>  |
| 15  | CI H        | C <sub>2</sub> H <sub>5</sub> | 0  | COC <sub>3</sub> H <sub>7</sub> -iso | н              | Н              | C <sub>2</sub> H <sub>5</sub>  |
|     | CI H        | C <sub>2</sub> H <sub>5</sub> | 0  | COC <sub>3</sub> H <sub>7</sub> -iso | Н              | н              | n-C <sub>3</sub> H <sub>7</sub>                                      |
|     | CI H        | C <sub>2</sub> H <sub>5</sub> | 0  | COC <sub>4</sub> H <sub>9</sub> -n   | Н              | н              | CH <sub>3</sub>  |
|     | CIH         | C <sub>2</sub> H <sub>5</sub> | 0  | COC <sub>4</sub> H <sub>9</sub> -n   | Н              | Н              | C <sub>2</sub> H <sub>5</sub>  |
| 20  | CIH         | C <sub>2</sub> H <sub>5</sub> | 0  | COC <sub>4</sub> H <sub>9</sub> -n   | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                                      |
|     | CI H        | C <sub>2</sub> H <sub>5</sub> | 0  | COC <sub>4</sub> H <sub>g</sub> -n   | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                                    |
|     | CI H        | C <sub>2</sub> H <sub>5</sub> | 0  | COCH2OCH3                            | Н              | Н              | CH <sub>3</sub>  |
|     | CI H        | C <sub>2</sub> H <sub>5</sub> | 0  | COCH <sub>2</sub> OCH <sub>3</sub>   | н              | Н              | C <sub>2</sub> H <sub>5</sub>  |
| 25  | CI H        | C <sub>2</sub> H <sub>5</sub> | 0  | сосносна                             | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                                      |
| 25  | _           |                               |    | 0                                    |                |                | 3.7  |
|     | CI H        | C <sub>2</sub> H <sub>5</sub> | 0  | -C- <del></del>                      | Н              | Н              | CH3  |
| 30  | СІН         | C <sub>2</sub> H <sub>5</sub> | 0  | -c                                   | н              | н              | C <sub>2</sub> H <sub>5</sub>  |
|     | сі н        | C₂H₅                          | 0  | 0<br>-C                              | н              | н              | n-C <sub>3</sub> H <sub>7</sub>                                      |
| 35  | СІН         | C <sub>2</sub> H <sub>5</sub> | 0  | COC <sub>6</sub> H <sub>5</sub>      | u              | ы              | CH   |
|     | CI H        | C <sub>2</sub> H <sub>5</sub> | 0  | COC <sub>6</sub> H <sub>5</sub>      | Н              | Н              | CH <sub>3</sub>  |
|     | CI H        | C <sub>2</sub> H <sub>5</sub> | 0  | COC <sub>6</sub> H <sub>5</sub>      | Н              | Н              | C <sub>2</sub> H <sub>5</sub>  |
|     | CI H        | C <sub>2</sub> H <sub>5</sub> | 0  | COC <sub>6</sub> H <sub>5</sub>      | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                                      |
| 40  | CI H        | C <sub>2</sub> H <sub>5</sub> | 0  | COC <sub>6</sub> H <sub>5</sub>      | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                                    |
|     |             | ~2' '5                        | ·  | _                                    | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>                                      |
|     | CI H        | C <sub>2</sub> H <sub>5</sub> | 0  | -c-⟨_}-œң                            | н              | н              | C <sub>2</sub> H <sub>5</sub>  |
| 45  | CI H        | 0.11                          | _  |                                      |                |                |  |
|     |             | C₂H <sub>5</sub>              | 1  | H                                    | Н              | Н              | CH3  |
|     |             | C₂H₅                          | 1  | H                                    | Н              | Н              | C <sub>2</sub> H <sub>5</sub>  |
|     |             | C₂H₅                          | 1  | Н                                    | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                                      |
| 50  | CI H        | C <sub>2</sub> H <sub>5</sub> | 1  | H                                    | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                                    |
|     |             | C <sub>2</sub> H <sub>5</sub> | 1  | Н                                    | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub><br>CH <sub>2</sub> CF <sub>3</sub> |
|     | CI H        | C <sub>2</sub> H <sub>5</sub> | 1  | н                                    | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>                                      |

Table 1 (continued)

| 5         | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>                | n | R <sup>5</sup>                                 | R <sup>6</sup> | R <sup>7</sup> | R <sup>9</sup>                    |
|-----------|----------------|----------------|-------------------------------|---|--|----------------|----------------|-----------------------------------|
|           | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | C₂H₅   | н              | н              | CH <sub>3</sub>                   |
|           | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | C <sub>2</sub> H <sub>5</sub>                  | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|           | CI             | Н              | C₂H₅                          | 1 | C <sub>2</sub> H <sub>5</sub>                  | Н              | н              | n-C <sub>3</sub> H <sub>7</sub>   |
| 10        | CI             | Н              | C₂H₅                          | 1 | C <sub>2</sub> H <sub>5</sub>                  | Н              | н              | iso-C <sub>3</sub> H <sub>7</sub> |
| 10        | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 1 | C <sub>2</sub> H <sub>5</sub>                  | н              | н              | n-C <sub>4</sub> H <sub>9</sub>   |
|           | CI             | Н              | C₂H₅                          | 1 | C <sub>2</sub> H <sub>5</sub>                  | н              | н              | iso-C <sub>4</sub> H <sub>9</sub> |
|           | CI             | Н              | C₂H₅                          | 1 | C <sub>2</sub> H <sub>5</sub>                  | Н              | н              | sec-C <sub>4</sub> H <sub>9</sub> |
| •         | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | C <sub>2</sub> H <sub>5</sub>                  | Н              | н              | CH <sub>2</sub> CF <sub>3</sub>   |
| 15        | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub>              | н              | н              | CH <sub>3</sub>                   |
|           | CI             | Н              | C₂H₅                          | 1 | iso-C <sub>3</sub> H <sub>7</sub>              | н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|           | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|           | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
| 20        | CI             | H              | C <sub>2</sub> H <sub>5</sub> | 1 | CH2OCH3  | Н              | Н              | CH <sub>3</sub>                   |
|           | CI             | Н              | C₂H₅                          | 1 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | СН3                               |
|           | CI             | Н              | C₂H₅                          | 1 | CH2OC2H5                                       | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|           | CI             | Н              | C₂H₅                          | 1 | CH <sub>2</sub> SCH <sub>3</sub>               | Н              | н              | CH <sub>3</sub>                   |
| 25        | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | CH <sub>2</sub> SCH <sub>3</sub>               | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
| 25        | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | COC <sub>2</sub> H <sub>5</sub>                | Н              | Н              | CH <sub>3</sub>                   |
|           | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | COC <sub>2</sub> H <sub>5</sub>                | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|           | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 1 | COC <sub>2</sub> H <sub>5</sub>                | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|           | Cf             | н              | C₂H₅                          | 1 | COC <sub>2</sub> H <sub>5</sub>                | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
| 30        | CI             | Н              | C₂H₅                          | 1 | COC <sub>3</sub> H <sub>7</sub> -n             | Н              | Н              | CH <sub>3</sub>                   |
|           | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | COC <sub>3</sub> H <sub>7</sub> -n             | н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|           | CI             | н              | C₂H₅                          | 1 | COC <sub>3</sub> H <sub>7</sub> -n             | н              | н              | n-C <sub>3</sub> H <sub>7</sub>   |
|           | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | COC <sub>3</sub> H <sub>7</sub> -n             | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
| <i>35</i> | CI             | Н              | C₂H₅                          | 1 | COC <sub>3</sub> H <sub>7</sub> -iso           | -н             | н              | CH <sub>3</sub>                   |
|           | CI             | Н              | C₂H₅                          | 1 | COC <sub>3</sub> H <sub>7</sub> -iso           | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|           | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | COC <sub>3</sub> H <sub>7</sub> -iso           | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|           | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 1 | COC <sub>3</sub> H <sub>7</sub> -iso           | н              | н              | iso-C <sub>3</sub> H <sub>7</sub> |
| 40        | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 1 | -c>  | н              | н              | CH <sub>3</sub>                   |
|           | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 1 | -c   | н              | н              | C <sub>2</sub> H <sub>5</sub>     |
| 45        | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 1 | -c   | н              | н              | n-C <sub>3</sub> H <sub>7</sub>   |
|           | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | -c-  | н              | н              | iso-C <sub>3</sub> H <sub>7</sub> |
| 50        | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 1 | COCH CCH                                       |                |                |                                   |
|           | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | COCH OCH                                       | н              | H              | CH₃                               |
|           | ٠,             | ••             | 21 15                         | 1 | COCH <sub>2</sub> OCH <sub>3</sub>             | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |

Table 1 (continued)

| 5  | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>                | n | R <sup>5</sup>                                 | R <sup>6</sup> | R <sup>7</sup> | R <sup>9</sup>                    |
|----|----------------|----------------|-------------------------------|---|--|----------------|----------------|-----------------------------------|
|    | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 1 | COCH2OCH3                                      | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | CI             | н              | C₂H₅                          | 1 | COC <sub>6</sub> H <sub>5</sub>                | Н              | Н              | CH <sub>3</sub>                   |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | COC <sub>8</sub> H <sub>5</sub>                | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 10 | CI             | Н              | C₂H₅                          | 1 | COC <sub>8</sub> H <sub>5</sub>                | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | COC <sub>6</sub> H <sub>5</sub>                | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | CI             | Н              | C₂H₅                          | 2 | Н  | Н              | Н              | CH <sub>3</sub>                   |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | Н  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | н  | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
| 15 | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | Н  | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | Н  | н              | н              | iso-C <sub>4</sub> H <sub>9</sub> |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | н  | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|    | CI             | Н              | C₂H₅                          | 2 | Н  | 2-F            | н              | C <sub>2</sub> H <sub>5</sub>     |
| 20 | CI             | Н              | C₂H₅                          | 2 | Н  | 3-F            | н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | Н  | 2-CI           | н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | Н  | 3-CI           | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | C <sub>2</sub> H <sub>5</sub>                  | н              | н              | CH <sub>3</sub>                   |
| 25 | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | C <sub>2</sub> H <sub>5</sub>                  | н              | Н              | C₂H₅                              |
| 23 | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | C <sub>2</sub> H <sub>5</sub>                  | н              | н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 2 | C <sub>2</sub> H <sub>5</sub>                  | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | C <sub>2</sub> H <sub>5</sub>                  | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>   |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | C <sub>2</sub> H <sub>5</sub>                  | н              | н              | sec-C <sub>4</sub> H <sub>9</sub> |
| 30 | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | C <sub>2</sub> H <sub>5</sub>                  | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | C <sub>2</sub> H <sub>5</sub>                  | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|    | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 2 | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | CH <sub>3</sub>                   |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | iso-C <sub>3</sub> H <sub>7</sub>              | H.             | н              | C <sub>2</sub> H <sub>5</sub>     |
| 35 | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | iso-C <sub>3</sub> H <sub>7</sub>              | н              | Н              | n-C₃H <sub>7</sub>                |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | CI             | Н              | C₂H₅                          | 2 | CH <sub>2</sub> OCH <sub>3</sub>               | н              | н              | CH <sub>3</sub>                   |
|    | CI             | Н              | C₂H₅                          | 2 | CH <sub>2</sub> OCH <sub>3</sub>               | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
| 40 | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | н              | CH <sub>3</sub>                   |
| •  | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | CH <sub>2</sub> SCH <sub>3</sub>               | Н              | Н              | CH <sub>3</sub>                   |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | CH <sub>2</sub> SCH <sub>3</sub>               | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
| -  | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | CHO  | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
| 45 | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | COC <sub>2</sub> H <sub>5</sub>                | н              | н              | CH <sub>3</sub>                   |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | COC <sub>2</sub> H <sub>5</sub>                | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 2 | COC <sub>2</sub> H <sub>5</sub>                | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | COC <sub>2</sub> H <sub>5</sub>                | Н              | н              | iso-C <sub>3</sub> H <sub>7</sub> |
| 50 | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | COC <sub>3</sub> H <sub>7</sub> -n             | Н              | н              | CH <sub>3</sub>                   |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | COC <sub>3</sub> H <sub>7</sub> -n             | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | COC <sub>3</sub> H <sub>7</sub> -n             | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |

Table 1 (continued)

| 5  | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>                    | n | R <sup>5</sup>                       | R <sup>6</sup> | R <sup>7</sup> | R <sup>9</sup>                    |
|----|----------------|----------------|-----------------------------------|---|--------------------------------------|----------------|----------------|-----------------------------------|
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub>     | 2 | COC <sub>3</sub> H <sub>7</sub> -n   | H              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub>     | 2 | COC <sub>3</sub> H <sub>7</sub> -iso | H              | Н              | CH <sub>3</sub>                   |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub>     | 2 | COC <sub>3</sub> H <sub>7</sub> -iso | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
| 10 | CI             | Н              | C <sub>2</sub> H <sub>5</sub>     | 2 | COC <sub>3</sub> H <sub>7</sub> -iso | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
| 70 | CI             | Н              | C <sub>2</sub> H <sub>5</sub>     | 2 | COC <sub>3</sub> H <sub>7</sub> -iso | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
| ·  | CI             | н              | C <sub>2</sub> H <sub>5</sub>     | 2 | -c                                   | н              | н              | сн3                               |
| 15 | CI             | Н              | C <sub>2</sub> H <sub>5</sub>     | 2 | -c- <u>-</u>                         | н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CI             | н              | C <sub>2</sub> H <sub>5</sub>     | 2 | -c                                   | Н              | н              | n-C <sub>3</sub> H <sub>7</sub>   |
| 20 | CI             | Н              | C <sub>2</sub> H <sub>5</sub>     | 2 | -c                                   | н              | н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | CI             | Н              | C₂H₅                              | 2 | COC <sub>6</sub> H <sub>5</sub>      | Н              | Н              | CH3                               |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub>     | 2 | COC <sub>6</sub> H <sub>5</sub>      | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 25 | CI             | Н              | C <sub>2</sub> H <sub>5</sub>     | 2 | COC <sub>6</sub> H <sub>5</sub>      | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub>     | 2 | COCH <sub>2</sub> OCH <sub>3</sub>   | Н              | Н              | CH <sub>3</sub>                   |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub>     | 2 | COCH <sub>2</sub> OCH <sub>3</sub>   | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub>     | 2 | COCH <sub>2</sub> OCH <sub>3</sub>   | Н              | H              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | CI             | н              | n-C <sub>3</sub> H <sub>7</sub>   | 0 | Н                                    | Н              | Н              | CH <sub>3</sub>                   |
| 30 | CI             | Н              | n-C <sub>3</sub> H <sub>7</sub>   | 0 | Н                                    | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CI             | Н              | n-C <sub>3</sub> H <sub>7</sub>   | 0 | Н                                    | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | CI             | Н              | n-C <sub>3</sub> H <sub>7</sub>   | 0 | Н                                    | Н              | н              | iso-C <sub>4</sub> H <sub>9</sub> |
|    | CI             | Н              | n-C <sub>3</sub> H <sub>7</sub>   | 0 | C <sub>2</sub> H <sub>5</sub>        | Н              | Н              | CH <sub>3</sub>                   |
| 35 | CI             | Н              | n-C <sub>3</sub> H <sub>7</sub>   | 0 | C <sub>2</sub> H <sub>5</sub>        | Н              | н              | C₂H₅                              |
|    | CI             | Н              | n-C <sub>3</sub> H <sub>7</sub>   | 0 | iso-C <sub>3</sub> H <sub>7</sub>    | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CI             | Н              | n-C <sub>3</sub> H <sub>7</sub>   | 0 | COC <sub>3</sub> H <sub>7</sub> -n   | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CI             | Н              | n-C <sub>3</sub> H <sub>7</sub>   | 1 | Н                                    | Н              | н              | CH <sub>3</sub>                   |
| 40 | CI             | Н              | n-C <sub>3</sub> H <sub>7</sub>   | 1 | Н                                    | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| •  | CI             | Н              | n-C <sub>3</sub> H <sub>7</sub>   | 1 | Н                                    | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | CI             | Н              | n-C <sub>3</sub> H <sub>7</sub>   | 1 | Н                                    | н              | н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | CI             | Н              | n-C <sub>3</sub> H <sub>7</sub>   | 1 | Н                                    | н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
|    | CI             | Н              | n-C <sub>3</sub> H <sub>7</sub>   | 1 | Н                                    | н              | н              | CH <sub>2</sub> CF <sub>3</sub>   |
| 45 | CI             | Н              | n-C <sub>3</sub> H <sub>7</sub>   | 2 | Н                                    | Н              | Н              | CH <sub>3</sub>                   |
|    | CI             | Н              | n-C <sub>3</sub> H <sub>7</sub>   | 2 | н                                    | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CI             | Н              | n-C <sub>3</sub> H <sub>7</sub>   | 2 | Н                                    | н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|    | CI             | Н              | n-C <sub>3</sub> H <sub>7</sub>   | 2 | Н                                    | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
| 50 | CI             | Н              | n-C <sub>3</sub> H <sub>7</sub>   | 2 | Н                                    | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | CI             | Н              | n-C <sub>3</sub> H <sub>7</sub>   | 2 | н                                    | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
|    | CI             | Н              | iso-C <sub>3</sub> H <sub>7</sub> | 0 | н                                    | Н              | Н              | СН                                |

Table 1 (continued)

| 5  | $R^1$ $R^2$ | R <sup>3</sup>                                    | n | _R <sup>5</sup>                    | R <sup>6</sup> | R <sup>7</sup> | R <sup>9</sup>                    |
|----|-------------|---|---|------------------------------------|----------------|----------------|-----------------------------------|
|    | CI H        | iso-C <sub>3</sub> H <sub>7</sub>                 | 0 | Н                                  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CI H        | iso-C <sub>3</sub> H <sub>7</sub>                 | 1 | н                                  | Н              | Н              | CH <sub>3</sub>                   |
|    | CI H        | iso-C <sub>3</sub> H <sub>7</sub>                 | 1 | Н                                  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 10 | CI H        | iso-C <sub>3</sub> H <sub>7</sub>                 | 2 | н                                  | н              | Н              | CH <sub>3</sub>                   |
| 10 | CI H        | iso-C <sub>3</sub> H <sub>7</sub>                 | 2 | н                                  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CI H        | n-C <sub>4</sub> H <sub>9</sub>                   | 0 | н                                  | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CI H        | sec-C <sub>4</sub> H <sub>9</sub>                 | 0 | н                                  | н              | н              | C <sub>2</sub> H <sub>5</sub>     |
| •  | CI H        | CH2OCH3   | Q | н                                  | Н              | Н              | CH <sub>3</sub>                   |
| 15 | CIH         | CH <sub>2</sub> OCH <sub>3</sub>                  | 0 | Н                                  | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CI H        | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub>    | 0 | н                                  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CIH         | CH <sub>2</sub> SI(CH <sub>3</sub> ) <sub>3</sub> | 0 | н                                  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CIH         | CH <sub>2</sub> F                                 | 0 | Н                                  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 20 | CI H        | CH <sub>2</sub> F                                 | 1 | н                                  | Н              | Н              | CH <sub>3</sub>                   |
|    | CI H        | CH <sub>2</sub> F                                 | 1 | н                                  | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CI H        | CH <sub>2</sub> F                                 | 1 | н                                  | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | CI H        | CH <sub>2</sub> F                                 | 1 | н                                  | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | CI H        | CH <sub>2</sub> F                                 | 1 | Н                                  | н              | н              | iso-C <sub>4</sub> H <sub>9</sub> |
| 25 | CI H        | CH <sub>2</sub> F                                 | 1 | н                                  | H              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|    | CI H        | CHF,  | 0 | Н                                  | н              | н              | CH <sub>3</sub>                   |
|    | CI H        | CHF <sub>2</sub>                                  | 0 | Н                                  | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CIH         | CHF <sub>2</sub>                                  | 0 | н                                  | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
| 30 | CIH         | CHF <sub>2</sub>                                  | 0 | н                                  | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
|    | CI H        | CHF <sub>2</sub>                                  | 0 | н                                  | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>   |
|    | CI H        | CHF <sub>2</sub>                                  | 0 | Н                                  | н              | Н              | n-C <sub>5</sub> H <sub>11</sub>  |
|    | CI H        | CHF <sub>2</sub>                                  | 0 | н                                  | H_             | н              | л-С <sub>6</sub> Н <sub>13</sub>  |
| 35 | CI H        | CHF <sub>2</sub>                                  | 0 | Н                                  | H              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|    | CI H        | CHF <sub>2</sub>                                  | 0 | C₂H₅                               | н              | Н              | CH <sub>3</sub>                   |
|    | CI H        | CHF <sub>2</sub>                                  | 0 | C <sub>2</sub> H <sub>5</sub>      | н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CI H        | CHF <sub>2</sub>                                  | 0 | iso-C <sub>3</sub> H <sub>7</sub>  | н              | н              | CH <sub>3</sub>                   |
| 40 | CI H        | CHF <sub>2</sub>                                  | 0 | iso-C <sub>3</sub> H <sub>7</sub>  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 40 | ~ CI H      | CHF <sub>2</sub>                                  | 0 | COC <sub>3</sub> H <sub>7</sub> -n | н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CI H        | CHF <sub>2</sub>                                  | 1 | Н                                  | н              | Н              | CH <sub>3</sub>                   |
|    | CI H        | CHF <sub>2</sub>                                  | 1 | н                                  | н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CI H        | CHF <sub>2</sub>                                  | 1 | н                                  | н              | н              | CH <sub>2</sub> CF <sub>3</sub>   |
| 45 | CI H        | CHF <sub>2</sub>                                  | 1 | Н                                  | н              | н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | CI H        | CHF,  | 1 | н                                  | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | CI H        | CHF <sub>2</sub>                                  | 1 | Н                                  | н              | н              | iso-C <sub>4</sub> H <sub>9</sub> |
|    | CI H        | CF <sub>3</sub>                                   | 0 | н                                  | н              | н              | CH <sub>3</sub>                   |
| 50 | Cl H        | CF <sub>3</sub>                                   | 0 | н                                  | н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|    | CIH         | CF <sub>3</sub>                                   | 0 | н                                  | н              | н              | CH <sub>2</sub> CF <sub>3</sub>   |
|    | CI H        | CF <sub>3</sub>                                   | 0 | н                                  | н              | н              | iso-C <sub>4</sub> H <sub>9</sub> |
|    |             | -   |   |                                    | • •            |                | 130-041 19                        |

Table 1 (continued)

| 5         | $R^1$ $R^2$ | R <sup>3</sup>                    | <u>n</u> | _R <sup>5</sup>                    | R <sup>6</sup> | R <sup>7</sup> | R <sup>9</sup>                    |
|-----------|-------------|-----------------------------------|----------|------------------------------------|----------------|----------------|-----------------------------------|
|           | CI H        | CF <sub>3</sub>                   | 0        | н                                  | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>   |
|           | CI H        | CF <sub>3</sub>                   | 0        | н                                  | н              | н              | n-C <sub>S</sub> H <sub>11</sub>  |
|           | CI H        | CF <sub>3</sub>                   | 0        | Н                                  | н              | Н              | n-C <sub>6</sub> H <sub>13</sub>  |
| 10        | CI H        | CH₂CI                             | 0        | Н                                  | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 70        | Ci H        | CH₂CH₂F                           | 0        | Н                                  | н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|           | CI H        | CH <sub>2</sub> CH <sub>2</sub> F | 0        | Н                                  | н              | н              | CH <sub>2</sub> CF <sub>3</sub>   |
|           | CI H        | CH <sub>2</sub> CH <sub>2</sub> F | 0        | Н                                  | н              | Н              | CH <sub>3</sub>                   |
| •         | CI H        | CH <sub>2</sub> CH <sub>2</sub> F | 0        | н                                  | н              | н              | iso-C <sub>4</sub> H <sub>9</sub> |
| 15        | CI H        | CH₂CH₂F                           | 0        | Н                                  | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|           | CI H        | CH <sub>2</sub> CH <sub>2</sub> F | 1        | н                                  | н              | Н              | CH <sub>3</sub>                   |
|           | CI H        | CH <sub>2</sub> CH <sub>2</sub> F | 1        | Н                                  | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|           | CI H        | CH <sub>2</sub> CH <sub>2</sub> F | 1        | Н                                  | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
| 20        | CI H        | CH <sub>2</sub> CH <sub>2</sub> F | 1        | Н                                  | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|           | CI H        | CH <sub>2</sub> CH <sub>2</sub> F | 1        | Н                                  | н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
|           | CI H        | CH <sub>2</sub> CH <sub>2</sub> F | 1        | Н                                  | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|           | CI H        | CH <sub>2</sub> CH <sub>2</sub> F | 2        | Н                                  | н              | н              | CH <sub>3</sub>                   |
| <i>25</i> | CI H        | CH <sub>2</sub> CH <sub>2</sub> F | 2        | Н                                  | н              | н              | C <sub>2</sub> H <sub>5</sub>     |
| 25        | CI H        | CH <sub>2</sub> CH <sub>2</sub> F | 2        | Н                                  | н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|           | CI H        | CH <sub>2</sub> CH <sub>2</sub> F | 2        | н                                  | н              | н              | n-C <sub>3</sub> H <sub>7</sub>   |
|           | CI H        | CH <sub>2</sub> CH <sub>2</sub> F | 2        | н                                  | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|           | CI H        | CH <sub>2</sub> CH <sub>2</sub> F | 2        | н                                  | Н              | н              | iso-C <sub>4</sub> H <sub>9</sub> |
| 30        | CI H        | CH <sub>2</sub> CHF <sub>2</sub>  | 0        | Н                                  | н              | н              | CH <sub>3</sub>                   |
|           | СІН         | CH <sub>2</sub> CHF <sub>2</sub>  | 0        | н                                  | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|           | CI H        | CH <sub>2</sub> CHF <sub>2</sub>  | 0        | Н                                  | н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|           | CI H        | CH2CHF2                           | 0        | н                                  | н              | Н              | iso-C₄H <sub>9</sub>              |
| 35        | CI H        | CH <sub>2</sub> CHF <sub>2</sub>  | 0        | н                                  | ŤН             | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|           | CI H        | CH <sub>2</sub> CHF <sub>2</sub>  | 1        | Н                                  | н              | Н              | CH <sub>3</sub>                   |
|           | CI H        | CH <sub>2</sub> CHF <sub>2</sub>  | 1        | Н                                  | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|           | CI H        | CH <sub>2</sub> CHF <sub>2</sub>  | 1        | Н                                  | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
| 40        | CI H        | CH <sub>2</sub> CHF <sub>2</sub>  | 1        | Н                                  | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|           | CI H        | CH <sub>2</sub> CHF <sub>2</sub>  | 1        | Н                                  | н              | н              | iso-C <sub>4</sub> H <sub>g</sub> |
|           | CI H        | CH <sub>2</sub> CHF <sub>2</sub>  | 1        | Н                                  | н              | н              | CH <sub>2</sub> CF <sub>3</sub>   |
|           | CI H        | CH <sub>2</sub> CHF <sub>2</sub>  | 2        | Н                                  | н              | Н              | CH <sub>3</sub>                   |
|           | CI H        | CH <sub>2</sub> CHF <sub>2</sub>  | 2        | н                                  | н              | н              | C <sub>2</sub> H <sub>5</sub>     |
| 45        | CI H        | CH <sub>2</sub> CHF <sub>2</sub>  | 2        | Н                                  | н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|           | CI H        | CH <sub>2</sub> CHF <sub>2</sub>  | 2        | н                                  | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|           | CI H        | CH <sub>2</sub> CHF <sub>2</sub>  | 2        | н                                  | н              | н              | iso-C <sub>3</sub> H <sub>7</sub> |
|           | CI H        | CH <sub>2</sub> CHF <sub>2</sub>  | 2        | Н                                  | н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
| 50        | CI H        | CH₂CF3                            | 0        | C <sub>2</sub> H <sub>5</sub>      | н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|           | CI H        | CH <sub>2</sub> CF <sub>3</sub>   | 0        | COC <sub>3</sub> H <sub>7</sub> -n | н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|           | CI H        | CH <sub>2</sub> CF <sub>3</sub>   | 0        | iso-C <sub>3</sub> H <sub>7</sub>  | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |

Table 1 (continued)

| 5  | £   | ₹ <u>1</u> | R <sup>2</sup>  | R <sup>3</sup>                                     | _1_ | R <sup>5</sup>                | R <sup>6</sup> | R <sup>7</sup> | R <sup>9</sup>                    |
|----|-----|------------|-----------------|--|-----|-------------------------------|----------------|----------------|-----------------------------------|
|    |     | CI         | Н               | CH₂CF₃   | 0   | Н                             | Н              | Н              | CH <sub>3</sub>                   |
|    |     | CI         | H               | CH <sub>2</sub> CF <sub>3</sub>                    | 0   | C <sub>2</sub> H <sub>5</sub> | н              | н              | сн₃                               |
|    |     | CI         | Н               | CH <sub>2</sub> CF <sub>3</sub>                    | 0   | н                             | Н              | н              | C₂H₅                              |
|    |     | CI         | н               | CH <sub>2</sub> CF <sub>3</sub>                    | 0   | Н                             | н              | н              | n-C <sub>4</sub> H <sub>9</sub>   |
| 10 | C   | CI         | н               | CH <sub>2</sub> CF <sub>3</sub>                    | 0   | н                             | н              | н              | iso-C <sub>4</sub> H <sub>9</sub> |
|    | (   | CI         | Н               | CH <sub>2</sub> CF <sub>3</sub>                    | 0   | Н                             | Н              | ∘H             | CH <sub>2</sub> CF <sub>3</sub>   |
|    | (   | CI         | Н               | CH <sub>2</sub> CF <sub>3</sub>                    | 1   | Н                             | н              | н              | CH <sub>3</sub>                   |
| •  |     | CI         | Н               | CH <sub>2</sub> CF <sub>3</sub>                    | 1   | н                             | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 15 |     | CI         | Н               | CH <sub>2</sub> CF <sub>3</sub>                    | 1   | Н                             | Н              | Н              | CH₂CF₃                            |
|    |     | CI         | н               | CH <sub>2</sub> CF <sub>3</sub>                    | 1   | Н                             | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    |     | CI         | Н               | CH₂CF₃   | 1   | Н                             | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | · ( | 21         | Н               | CH <sub>2</sub> CF <sub>3</sub>                    | 1   | Н                             | Н              | н              | iso-C <sub>4</sub> H <sub>9</sub> |
| 20 | C   | CI         | Н               | CH₂CF <sub>3</sub>                                 | 2   | Н                             | Н              | н              | CH <sub>3</sub>                   |
|    | C   |            | Н               | CH <sub>2</sub> CF <sub>3</sub>                    | 2   | Н                             | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    |     | CI         | Н               | CH <sub>2</sub> CF <sub>3</sub>                    | 2   | Н                             | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|    |     | CI         | Н               | CH <sub>2</sub> CF <sub>3</sub>                    | 2   | Н                             | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
| 25 |     |            | Н               | CH₂CF₃   | 2   | н                             | Н              | н              | iso-C <sub>3</sub> H <sub>7</sub> |
| 25 |     | CI         | н               | CH <sub>2</sub> CF <sub>3</sub>                    | 2   | Н                             | Н              | н              | iso-C <sub>4</sub> H <sub>9</sub> |
|    |     | C)         | Н               | CH₂CH₂CI   | 0   | н                             | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|    |     | 21         | н               | CH₂CH₂CI   | 2   | н                             | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    |     | Ci         | Н               | CH₂CH₂CH₂F   | 0   | н                             | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 30 |     |            | Н               | CH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> F  | 2   | н                             | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|    |     |            | Н               | CH <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> H  | 0   | н                             | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|    |     |            | Н               | CF2CF2CF3  | 0   | н                             | Н              | Н              | C <sub>z</sub> H <sub>5</sub>     |
|    |     |            | Н               | CH <sup>2</sup> CH <sup>2</sup> CH <sup>3</sup> CI | 0   | н                             | H              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 35 |     | Ci         | Н               | CH≃CH <sub>2</sub>                                 | 0   | н                             | H              | Н              | CH <sub>3</sub>                   |
|    |     | CI         | Н               | CH≃CH <sub>2</sub>                                 | 0   | Н                             | Н              | Н              | C₂H₅                              |
|    |     |            | Н               | CH2CH=CH2  | 0   | н                             | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    |     | CI         | Н               | CH <sub>2</sub> CH=CH <sub>2</sub>                 | 1   | Н                             | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
| 40 |     |            | Н               | CH <sub>2</sub> CH=CH <sub>2</sub>                 | 2   | Н                             | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    |     |            | Н               | CH <sub>2</sub> C≡CH                               | 0   | Н                             | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|    |     | CI         | Н               | CH <sub>2</sub> C=CH                               | 0   | Н                             | Н              | Н              | CH <sub>3</sub>                   |
|    |     | CI         | Н               | CH <sub>2</sub> C≡CH                               | 1   | Н                             | Н              | Н              | C₂H₅                              |
|    |     | Cl         | Н               | CH <sub>2</sub> C≅CH                               | 2   | Н                             | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 45 |     | Cl         | Н               | CH <sub>2</sub> CN                                 | 0   | Н                             | Н              | Н              | CH <sub>3</sub>                   |
|    |     |            | н               | CH₂CN  | 0   | Н                             | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    |     |            | H               | CH <sub>2</sub> CN                                 | 1   | н                             | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    |     | CI         | H               | CH <sub>2</sub> CN                                 | 2   | Н                             | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 50 |     | CI         | CH <sub>3</sub> | CH <sub>3</sub>                                    | 0   | Н                             | Н              | Н              | CH <sub>3</sub>                   |
|    |     | C1         | CH <sub>3</sub> | CH <sub>3</sub>                                    | 0   | н                             | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | (   | CI         | CH <sub>3</sub> | CH3  | 0   | Н                             | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |

Table 1 (continued)

| 5    | R <sup>1</sup> | R <sup>2</sup>                  | R <sup>3</sup>  | n | R <sup>5</sup>                    | R <sup>6</sup> | R <sup>7</sup> | _R <sup>9</sup>                               |
|------|----------------|---------------------------------|-----------------|---|-----------------------------------|----------------|----------------|---|
|      | CI             | CH3                             | CH3             | 0 | Н                                 | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>               |
|      | CI             | CH3                             | CH3             | 0 | Н                                 | Н              | Н              | CH2CF3  |
|      | CI             | CH3                             | CH <sub>3</sub> | 1 | Н                                 | Н              | Н              | CH <sub>3</sub>                               |
|      | CI             | CH3                             | CH3             | 1 | Н                                 | Н              | Н              | C₂H₅  |
| 10   | CI             | CH <sub>3</sub>                 | CH <sub>3</sub> | 1 | Н                                 | н              | н              | iso-C <sub>4</sub> H <sub>9</sub>             |
|      | CI             | CH³                             | CH <sub>3</sub> | 1 | Н                                 | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>               |
|      | CI             | CH3                             | CH <sub>3</sub> | 2 | н                                 | Н              | Н              | CH <sub>3</sub>                               |
| •    | CI             | CH₃                             | CH3             | 2 | Н                                 | Н              | H <sup>c</sup> | C <sub>2</sub> H <sub>5</sub>                 |
| 15   | CI             | CH <sub>3</sub>                 | CH <sub>3</sub> | 2 | н                                 | н              | н              | iso-C <sub>4</sub> H <sub>9</sub>             |
|      | CI             | CH <sub>3</sub>                 | CH <sub>3</sub> | 2 | н                                 | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>               |
|      | CI             | C <sub>2</sub> H <sub>5</sub>   | CH <sub>3</sub> | 0 | H                                 | н              | н              | CH <sub>3</sub>                               |
| ,    | CI             | C <sub>2</sub> H <sub>5</sub>   | CH <sub>3</sub> | 0 | Н                                 | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                 |
| 20   | CI             | C <sub>2</sub> H <sub>5</sub>   | CH <sub>3</sub> | 1 | Н                                 | H              | Н              | C <sub>2</sub> H <sub>5</sub>                 |
|      | CI             | C <sub>2</sub> H <sub>5</sub>   | CH <sub>3</sub> | 2 | Н                                 | н              | н              | C <sub>2</sub> H <sub>5</sub>                 |
|      | CI             | n-C <sub>3</sub> H <sub>7</sub> | CH <sub>3</sub> | 0 | Н                                 | Н              | н              | C <sub>2</sub> H <sub>5</sub>                 |
|      | Br             | Н                               | CH <sub>3</sub> | 0 | Н                                 | Н              | н              | CH <sub>3</sub>                               |
|      | Br             | Н                               | CH <sub>3</sub> | 0 | Н                                 | Н              | н              | C <sub>2</sub> H <sub>5</sub>                 |
| 25   | Br             | Н                               | CH <sub>3</sub> | 0 | Н                                 | Н              | н              | n-C <sub>3</sub> H <sub>7</sub>               |
|      | Br             | Н                               | CH <sub>3</sub> | 0 | Н                                 | Н              | н              | iso-C <sub>3</sub> H <sub>7</sub>             |
|      | Br             | Н                               | CH <sub>3</sub> | 0 | н                                 | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>               |
|      | Br             | н                               | CH <sub>3</sub> | 0 | Н                                 | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>             |
| 30   | Br             | Н                               | CH <sub>3</sub> | 0 | н                                 | н              | н              | iso-C <sub>4</sub> H <sub>9</sub>             |
|      | Br             | Н                               | CH <sub>3</sub> | 0 | н                                 | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>            |
|      | Br             | Н                               | CH <sub>3</sub> | 0 | Н                                 | н              | Н              | n-C <sub>5</sub> H <sub>11</sub>              |
|      | Br             | Н                               | CH <sub>3</sub> | 0 | Н                                 | "H             | н              | n-C <sub>6</sub> H <sub>13</sub>              |
| 35   | Br             | Н                               | CH <sub>3</sub> | 0 | Н                                 | Н              | н              | CH <sub>2</sub> C≕CH                          |
|      | Br             | Н                               | CH <sub>3</sub> | 0 | н                                 | Н              | Н              | CH <sub>2</sub> C <sub>6</sub> H <sub>5</sub> |
|      | Br             | Н                               | CH <sub>3</sub> | 0 | н                                 | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>               |
|      | Br             | Н                               | CH <sub>3</sub> | 0 | CH <sub>3</sub>                   | н              | н              | CH <sub>3</sub>                               |
| 40   | Br             | Н                               | CH <sub>3</sub> | 0 | CH <sub>3</sub>                   | Н              | Н              | C₂H <sub>s</sub>                              |
| 40 ~ | Br             | Н                               | CH3             | 0 | C <sub>2</sub> H <sub>5</sub>     | Н              | Н              | CH <sub>3</sub>                               |
|      | Br             | Н                               | CH3             | 0 | C <sub>2</sub> H <sub>5</sub>     | н              | Н              | C₂H <sub>s</sub>                              |
|      | Br             | Н                               | CH <sub>3</sub> | 0 | C <sub>2</sub> H <sub>5</sub>     | н              | н              | n-C <sub>3</sub> H <sub>7</sub>               |
|      | Br             | Н                               | CH <sub>3</sub> | 0 | C <sub>2</sub> H <sub>5</sub>     | н              | н              | iso-C <sub>3</sub> H <sub>7</sub>             |
| 45   | Br             | Н                               | сн₃             | 0 | C <sub>2</sub> H <sub>5</sub>     | н              | н              | n-C <sub>4</sub> H <sub>9</sub>               |
|      | Br             | н                               | CH <sub>3</sub> | 0 | C <sub>2</sub> H <sub>5</sub>     | н              | н              | iso-C <sub>4</sub> H <sub>9</sub>             |
|      | Br             | Н                               | CH <sub>3</sub> | 0 | C <sub>2</sub> H <sub>5</sub>     | Н              | н              | sec-C₄H <sub>9</sub>                          |
|      | Br             | Н                               | CH <sub>3</sub> | 0 | C <sub>2</sub> H <sub>5</sub>     | Н              | н              | CH <sub>2</sub> CF <sub>3</sub>               |
| 50   | Br             | Н                               | CH₃             | 0 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | сн₃   |
|      | Br             | н                               | CH <sub>3</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | C₂H <sub>5</sub>                              |
|      | Br             | Н                               | CH₃             | 0 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>               |
|      |                |                                 |                 |   |                                   |                |                | - ·   |

Table 1 (continued)

| 5  | R1   | R <sup>2</sup> | _R <sup>3</sup> | <u>n</u> | R <sup>5</sup>                                 | R <sup>6</sup> | R <sup>7</sup> | R <sup>9</sup>                    |
|----|------|----------------|-----------------|----------|--|----------------|----------------|-----------------------------------|
|    | Br   | Н              | CH3             | 0        | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | Br   | Н              | CH <sub>3</sub> | 0        | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
|    | Br   | Н              | CH₃             | 0        | iso-C <sub>3</sub> H <sub>7</sub>              | н              | н              | CH2CF3                            |
| 10 | Br   | Н              | CH₃             | 0        | CH <sub>2</sub> SCH <sub>3</sub>               | Н              | Н              | CH <sub>3</sub>                   |
| 70 | Br   | H ·            | CH3             | 0        | CH <sub>2</sub> OCH <sub>3</sub>               | Н              | Н              | сн₃                               |
|    | Br   | Н              | CH3             | 0        | CH <sub>2</sub> OCH <sub>3</sub>               | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | Br   | Н              | CH3             | 0        | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | Br   | Н              | CH3             | 0        | CH <sub>2</sub> SCH <sub>3</sub>               | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 15 | Br   | н              | CH <sub>3</sub> | 0        | СНО  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | Br   | н              | CH3             | 0        | COCH3  | H              | Н              | CH <sub>3</sub>                   |
|    | Br   | Н              | CH <sub>3</sub> | 0        | COCH <sub>3</sub>                              | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | Br   | Н              | CH <sub>3</sub> | 0        | COC <sub>2</sub> H <sub>5</sub>                | н              | н              | CH₃                               |
| 20 | Br   | Н              | CH <sub>3</sub> | 0        | COC <sub>2</sub> H <sub>5</sub>                | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|    | Br   | Н              | CH3             | 0        | COC <sub>2</sub> H <sub>5</sub>                | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | Br   | Н              | CH <sub>3</sub> | 0        | COC <sub>3</sub> H <sub>7</sub> -n             | Н              | Н              | CH <sub>3</sub>                   |
|    | Br   | Н              | CH3             | 0        | COC <sub>3</sub> H <sub>7</sub> -n             | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 25 | Br   | н              | CH3             | 0        | COC <sub>3</sub> H <sub>7</sub> -n             | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | Br   | Н              | CH <sub>3</sub> | 0        | COC <sub>3</sub> H <sub>7</sub> -n             | Н              | н              | iso-C₄H <sub>9</sub>              |
|    | Br   | н              | CH <sub>3</sub> | 0        | COC <sub>3</sub> H <sub>7</sub> -n             | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | Br   | Н              | CH3             | 0        | COCH2OCH3                                      | Н              | н              | n-C <sub>3</sub> H <sub>7</sub>   |
| 30 | Br   | H              | CH <sub>3</sub> | 0        | COC <sub>e</sub> H <sub>5</sub>                | Н              | Н              | CH <sub>3</sub>                   |
| 30 | 8r   | н              | CH <sub>3</sub> | 0        | COC <sub>6</sub> H <sub>5</sub>                | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    |      |                |                 |          | 0  |                |                | 2 3                               |
|    | Br   | Н              | CH3             | 0        | -4-7-7   | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    |      |                |                 |          | 0 (/-ws  | -              |                |                                   |
| 35 |      |                |                 |          |  |                |                |                                   |
|    | Br   | H              | CH <sub>3</sub> | 0        | COCH=CHC <sub>6</sub> H <sub>5</sub>           | Н              | Н              | C₂H₅                              |
|    | Br   | Н              | CH <sub>3</sub> | 0        | COCH2OCH3                                      | Н              | Н              | CH <sub>3</sub>                   |
|    | Br   | Н              | CH <sub>3</sub> | 0        | COCH₂OCH₃                                      | Н              | Н              | C₂H₅                              |
| 40 | Br   | Н              | CH <sub>3</sub> | 1        | Н  | Н              | Н              | CH3                               |
|    | · Br | Н              | CH <sub>3</sub> | 1        | н  | н              | Н              | C₂H₅                              |
|    | Br   | Н              | CH <sub>3</sub> | 1        | н  | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | Br   | Н              | CH3             | 1        | Н  | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
| 45 | Br   | Н              | CH3             | 1        | н  | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
| ~  | Br   | Н              | CH3             | 1        | н  | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|    | Вг   | Н              | CH <sub>3</sub> | 1        | C <sub>2</sub> H <sub>5</sub>                  | Н              | Н              | CH <sub>3</sub>                   |
|    | Br   | H              | CH₃             | 1        | C <sub>2</sub> H <sub>5</sub>                  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | Br   | H              | CH <sub>3</sub> | 1        | C <sub>2</sub> H <sub>5</sub>                  | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
| 50 | Br   | H              | CH <sub>3</sub> | 1        | C <sub>2</sub> H <sub>5</sub>                  | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | Br   | H              | CH3             | 1        | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | CH <sub>3</sub>                   |
|    | Br   | Н              | CH <sub>3</sub> | 1        | iso-C <sub>3</sub> H <sub>7</sub>              | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |

Table 1 (continued)

| 5         | R <sup>1</sup> R <sup>2</sup> | R <sup>3</sup>                | n | R <sup>5</sup>                     | R <sup>6</sup> | R <sup>7</sup> | R <sup>9</sup>                    |
|-----------|-------------------------------|-------------------------------|---|------------------------------------|----------------|----------------|-----------------------------------|
|           | Br H                          | CH <sub>3</sub>               | 1 | iso-C <sub>3</sub> H <sub>7</sub>  | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|           | Br H                          | CH <sub>3</sub>               | 1 | iso-C <sub>3</sub> H <sub>7</sub>  | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|           | Br H                          | CH₃                           | 1 | COC <sub>2</sub> H <sub>5</sub>    | н              | Н              | CH <sub>3</sub>                   |
| 10        | Вг Н                          | CH₃                           | 1 | COC <sub>2</sub> H <sub>5</sub>    | н              | н              | C <sub>2</sub> H <sub>5</sub>     |
| 70        | Br H                          | CH₃                           | 1 | COC <sub>3</sub> H <sub>7</sub> -n | н              | н              | CH <sub>3</sub>                   |
|           | Br H                          | CH₃                           | 1 | COC <sub>3</sub> H <sub>7</sub> -n | н              | ·H             | C <sub>2</sub> H <sub>5</sub>     |
|           | Br H                          | CH <sub>3</sub>               | 1 | COC <sub>2</sub> H <sub>5</sub>    | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|           | Вг Н                          | CH3.                          | 1 | COC <sub>3</sub> H <sub>7</sub> -n | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
| 15        | Br H                          | CH <sub>3</sub>               | 1 | COCH <sub>2</sub> OCH <sub>3</sub> | н              | н              | n-C <sub>3</sub> H <sub>7</sub>   |
|           | Br Ḥ                          | CH₃                           | 1 | COCH2OCH3                          | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|           | Br H                          | CH <sub>3</sub>               | 1 | COCH2OCH3                          | н              | Н              | CH <sub>3</sub>                   |
|           | Вг Н                          | CH <sub>3</sub>               | 1 | COC <sub>3</sub> H <sub>7</sub> -n | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
| 20        | Br H                          | CH₃                           | 2 | Н                                  | н              | н              | CH <sub>3</sub>                   |
|           | Br H                          | CH <sub>3</sub>               | 2 | Н                                  | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|           | Br H                          | CH₃                           | 2 | Н                                  | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|           | Br H                          | CH3                           | 2 | Н                                  | н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
| 25        | Br H                          | CH <sub>3</sub>               | 2 | Н                                  | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|           | Br H                          | CH <sub>3</sub>               | 2 | н                                  | н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|           | Br H                          | CH <sub>3</sub>               | 2 | C <sub>2</sub> H <sub>5</sub>      | н              | Н              | CH <sub>3</sub>                   |
|           | Br H                          | CH <sub>3</sub>               | 2 | C <sub>2</sub> H <sub>5</sub>      | Н              | Н              | C₂H <sub>s</sub>                  |
| 30        | Br H                          | CH <sub>3</sub>               | 2 | C <sub>2</sub> H <sub>5</sub>      | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|           | Br H                          | CH <sub>3</sub>               | 2 | C <sub>2</sub> H <sub>5</sub>      | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|           | Br H                          | CH <sub>3</sub>               | 2 | iso-C <sub>3</sub> H <sub>7</sub>  | Н              | Н              | CH <sub>3</sub>                   |
|           | Br H                          | CH3                           | 2 | iso-C <sub>3</sub> H <sub>7</sub>  | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| <i>35</i> | Br H                          | CH3                           | 2 | iso-C <sub>3</sub> H <sub>7</sub>  | - H            | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
| •         | Br H                          | CH3                           | 2 | iso-C <sub>3</sub> H <sub>7</sub>  | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|           | Br H                          | CH <sub>3</sub>               | 2 | CH₂OCH₃                            | Н              | Н              | CH₃ ,                             |
|           | Br H                          | CH <sub>3</sub>               | 2 | COC₂H₅                             | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|           | Br H                          | CH3                           | 2 | COCH2OCH3                          | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 40        | Br H                          | CH <sub>3</sub>               | 2 | COC <sub>2</sub> H <sub>5</sub>    | Н              | Н              | CH <sub>3</sub>                   |
|           | Br H                          | CH <sub>3</sub>               | 2 | COC <sub>2</sub> H <sub>5</sub>    | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|           | Br H                          | CH <sub>3</sub>               | 2 | COC <sub>3</sub> H <sub>7</sub> -n | Н              | Н              | CH <sub>3</sub>                   |
|           | Br H                          | CH <sub>3</sub>               | 2 | COC <sub>3</sub> H <sub>7</sub> -n | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 45        | Br H                          | CH <sub>3</sub>               | 2 | COC <sub>3</sub> H <sub>7</sub> -n | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|           | Br H                          | CH <sub>3</sub>               | 2 | COC <sub>3</sub> H <sub>7</sub> -n | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|           | Br H                          | CH <sub>3</sub>               | 2 | COCH2OCH3                          | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|           | Br H                          | CH <sub>3</sub>               | 2 | COCH2OCH3                          | н              | Н              | CH <sub>3</sub>                   |
| 50        | Br H                          | CH <sub>3</sub>               | 2 | COC <sub>6</sub> H <sub>5</sub>    | н              | Н              | C₂H₅                              |
|           | Br H                          | C₂H₅                          | 0 | Н                                  | н              | Н              | CH <sub>3</sub>                   |
|           | Br H                          | C <sub>2</sub> H <sub>5</sub> | 0 | Н                                  | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|           |                               |                               |   |                                    |                |                |                                   |

Table 1 (continued)

|     |            |                |                               |     |                                    |                |                | -                                 |
|-----|------------|----------------|-------------------------------|-----|------------------------------------|----------------|----------------|-----------------------------------|
| 5   | <u>R</u> 1 | R <sup>2</sup> | R <sup>3</sup>                | n_  | R <sup>5</sup>                     | R <sup>6</sup> | R <sup>7</sup> | R <sup>9</sup>                    |
| •   | Br         | Н              | C₂H₅                          | 0   | Н                                  | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|     | Br         | Н              | C₂H₅                          | 0   | Н                                  | н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
|     | Br         | Н              | C₂H₅                          | . 0 | н                                  | н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|     | Br         | Н              | C₂H₅                          | 0   | CH <sub>3</sub>                    | н              | Н              | CH <sub>3</sub>                   |
| 10  | Br         | Н              | C₂H₅                          | 0   | CH <sub>3</sub>                    | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|     | Br         | Н              | C₂H₅                          | 0   | C <sub>2</sub> H <sub>5</sub>      | Н              | Н              | CH <sub>3</sub>                   |
|     | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 0   | C <sub>2</sub> H <sub>5</sub>      | Н              | Н              | C₂H₅                              |
|     | . Br       | Н              | C₂H₅                          | 0   | C <sub>2</sub> H <sub>5</sub>      | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
| 15  | Br         | Н              | C₂H₅                          | 0   | C <sub>2</sub> H <sub>5</sub>      | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|     | Br         |                | C₂H₅                          | 0   | C <sub>2</sub> H <sub>5</sub>      | н              | н              | n-C <sub>4</sub> H <sub>g</sub>   |
|     | Br         |                | C₂H₅                          | 0   | C <sub>2</sub> H <sub>5</sub>      | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
|     | · Br       |                | C₂H₅                          | 0   | C <sub>2</sub> H <sub>5</sub>      | Н              | н              | sec-C <sub>4</sub> H <sub>9</sub> |
| 20  | Br         |                | C₂H₅                          | 0   | C <sub>2</sub> H <sub>5</sub>      | н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|     | Br         |                | C₂H₅                          | 0   | iso-C <sub>3</sub> H <sub>7</sub>  | н              | Н              | CH <sub>3</sub>                   |
|     | Br         |                | C₂H <sub>5</sub>              | 0   | iso-C <sub>3</sub> H <sub>7</sub>  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|     | Br         | Н              | C₂H₅                          | 0   | iso-C <sub>3</sub> H <sub>7</sub>  | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
| 0.5 | Br         | Н              | C₂H₅                          | 0   | iso-C <sub>3</sub> H <sub>7</sub>  | н              | н              | iso-C <sub>3</sub> H <sub>7</sub> |
| 25  | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 0   | iso-C <sub>3</sub> H <sub>7</sub>  | н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
|     | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 0   | iso-C <sub>3</sub> H <sub>7</sub>  | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|     | Br         |                | C₂H₅                          | 0   | CH₂OCH₃                            | н              | Н              | CH <sub>3</sub>                   |
|     | Br         |                | C₂H₅                          | 0   | CH <sub>2</sub> OCH <sub>3</sub>   | Н              | н              | C₂H <sub>5</sub>                  |
| 30  | Br         |                | C₂H₅                          | 0   | CH₂SCH₃                            | н              | Н              | CH <sub>3</sub>                   |
|     | Br         | Н              | C₂H₅                          | 0   | CH <sub>2</sub> SCH <sub>3</sub>   | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|     | Br         | Н              | C₂H₅                          | 0   | CHO                                | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|     | Br         |                | C₂H₅                          | 0   | COCH3                              | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 35  | Br         |                | C₂H <sub>5</sub>              | 0   | COC <sub>2</sub> H <sub>5</sub>    | H*             | Н              | CH <sub>3</sub>                   |
|     | Br         | • •            | C₂H <sub>5</sub>              | 0   | COC <sub>2</sub> H <sub>5</sub>    | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|     | Br         |                | C₂H₅                          | 0   | COC <sub>2</sub> H <sub>5</sub>    | н              | н              | n-C <sub>3</sub> H <sub>7</sub>   |
|     | Br         |                | C₂H₅                          | 0   | COC <sub>2</sub> H <sub>5</sub>    | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
| 40  | Br         |                | C₂H₅                          | 0   | COC₃H <sub>7</sub> -n              | н              | Н              | CH₃ ´ ́                           |
| 40  | - Br       |                | C₂H <sub>5</sub>              | 0   | COC <sub>3</sub> H <sub>7</sub> -n | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|     | Br         |                | C₂H <sub>5</sub>              | 0   | COC <sub>3</sub> H <sub>7</sub> -n | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|     | Br         |                | C₂H₅                          | 0   | COC <sub>3</sub> H <sub>7</sub> -n | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|     | 8r         |                | C₂H <sub>5</sub>              | 0   | COC <sub>3</sub> H <sub>7</sub> -n | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
| 45  | Br         |                | C₂H <sub>5</sub>              | 0   | COCH2OCH3                          | н              | Н              | CH <sub>3</sub>                   |
|     | Br         |                | C <sub>2</sub> H <sub>5</sub> | 0   | COCHZOCHZ                          | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|     | Br         |                | C <sub>2</sub> H <sub>5</sub> | 0   | COCH <sub>2</sub> OCH <sub>3</sub> | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|     | Br         |                | C⁵H²                          | 0   | COC <sub>6</sub> H <sub>5</sub>    | н              | Н              | CH <sub>3</sub>                   |
| 50  | Br         |                | C <sub>2</sub> H <sub>5</sub> | 0   | COC <sub>6</sub> H <sub>5</sub>    | н              | Н              | C₂H <sub>s</sub>                  |
|     | Br<br>-    |                | C <sub>2</sub> H <sub>5</sub> | 1   | н                                  | н              | Н              | CH <sub>3</sub>                   |
|     | Br         | Н              | C₂H₅                          | 1   | Н                                  | н              | н              | C <sub>2</sub> H <sub>5</sub>     |

Table 1 (continued)

| 5  | R1 R2  | R <sup>3</sup>                | n | R <sup>5</sup>                     | R <sup>6</sup> _ | R <sup>7</sup> | R <sup>9</sup>                    |
|----|--------|-------------------------------|---|------------------------------------|------------------|----------------|-----------------------------------|
|    | Br H   | C₂H₅                          | 1 | н                                  | Н                | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | Br H   | C₂H₅                          | 1 | Н                                  | н                | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | Br H   | C <sub>2</sub> H <sub>5</sub> | 1 | н                                  | н                | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
| 10 | Br H   | C <sub>2</sub> H <sub>5</sub> | 1 | Н                                  | н                | н              | CH <sub>2</sub> CF <sub>3</sub>   |
|    | Br H   | C₂H₅                          | 1 | C₂H₅                               | н                | н              | CH <sub>3</sub>                   |
|    | Br H   | C₂H₅                          | 1 | C₂H₅                               | н                | Н              | C₂H₅                              |
|    | Br H   | C <sub>2</sub> H <sub>5</sub> | 1 | C <sub>2</sub> H <sub>5</sub>      | Н                | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | Br H   | C₂H₅                          | 1 | C₂H₅                               | н                | н              | iso-C <sub>3</sub> H <sub>7</sub> |
| 15 | Br H   | C₂H₅                          | 1 | iso-C <sub>3</sub> H <sub>7</sub>  | н                | Н              | CH₃ .                             |
|    | Br H   | C₂H₅                          | 1 | iso-C <sub>3</sub> H <sub>7</sub>  | Н                | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | . Br H | C₂H₅                          | 1 | iso-C <sub>3</sub> H <sub>7</sub>  | Н                | н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | Br H   | C <sub>2</sub> H <sub>5</sub> | 1 | COC <sub>2</sub> H <sub>5</sub>    | н                | Н              | CH <sub>3</sub>                   |
| 20 | Br H   | C <sub>2</sub> H <sub>5</sub> | 1 | COC <sub>2</sub> H <sub>5</sub>    | н                | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | Br H   | C₂H₅                          | 1 | COC <sub>2</sub> H <sub>5</sub>    | н                | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | Br H   | C₂H₅                          | 1 | COC <sub>3</sub> H <sub>7</sub> -n | Н                | Н              | CH <sub>3</sub>                   |
|    | Br H   | C <sub>2</sub> H <sub>5</sub> | 1 | COC <sub>3</sub> H <sub>7</sub> -n | н                | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 25 | Br H   | C <sub>2</sub> H <sub>5</sub> | 1 | COC <sub>3</sub> H <sub>7</sub> n  | н                | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | Br H   | C₂H₅                          | 1 | COC <sub>3</sub> H <sub>7</sub> -n | н                | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | Br H   | C <sub>2</sub> H <sub>5</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub>  | н                | н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | Br H   | C <sub>2</sub> H <sub>5</sub> | 1 | COCH2OCH3                          | н                | Н              | CH <sub>3</sub>                   |
| 30 | Br H   | C₂H₅                          | 1 | COCH2OCH3                          | н                | Н              | C₂H <sub>5</sub>                  |
|    | Br H   | C₂H₅                          | 1 | COCH2OCH3                          | н                | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | Br H   | C₂H₅                          | 2 | Н                                  | Н                | н              | CH <sub>3</sub>                   |
|    | Br H   | C₂H₅                          | 2 | Н                                  | н                | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 35 | Br H   | C₂H₅                          | 2 | Н                                  | - H              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
| 33 | Br H   | C <sub>2</sub> H <sub>5</sub> | 2 | Н                                  | н                | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | Br H   | C <sub>2</sub> H <sub>5</sub> | 2 | Н                                  | н                | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
|    | Br H   | C₂H₅                          | 2 | Н                                  | н                | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|    | Br H   | C <sub>2</sub> H <sub>5</sub> | 2 | C <sub>2</sub> H <sub>5</sub>      | н                | Н              | CH <sub>3</sub>                   |
| 40 | Br H   | C <sub>2</sub> H <sub>5</sub> | 2 | C <sub>2</sub> H <sub>5</sub>      | Н                | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | Вг Н   | C <sub>2</sub> H <sub>5</sub> | 2 | C <sub>2</sub> H <sub>5</sub>      | Н                | Н              | n-C₃H <sub>7</sub>                |
|    | Br H   | C <sub>2</sub> H <sub>5</sub> | 2 | C <sub>2</sub> H <sub>5</sub>      | н                | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | Br H   | C <sub>2</sub> H <sub>5</sub> | 2 | iso-C <sub>3</sub> H <sub>7</sub>  | н                | Н              | CH <sub>3</sub>                   |
| 45 | Br H   | C <sub>2</sub> H <sub>5</sub> | 2 | iso-C <sub>3</sub> H <sub>7</sub>  | н                | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | Br H   | C <sub>2</sub> H <sub>5</sub> | 2 | iso-C <sub>3</sub> H <sub>7</sub>  | н                | н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | Br H   | C₂H₅                          | 2 | iso-C <sub>3</sub> H <sub>7</sub>  | н                | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | Br H   | C₂H₅                          | 2 | CH₂OCH₃                            | н                | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 50 | Br H   | C <sub>2</sub> H <sub>5</sub> | 2 | COC <sub>2</sub> H <sub>5</sub>    | н                | н              | CH <sub>3</sub>                   |
|    | Br H   | C₂H₅                          | 2 | COC <sub>2</sub> H <sub>5</sub>    | н                | н              | C <sub>2</sub> H <sub>5</sub>     |
|    | Br H   | C₂H₅                          | 2 | COC <sub>2</sub> H <sub>5</sub>    | н                | Н              | n-C <sub>3</sub> H <sub>7</sub>   |

Tabl 1 (continued)

|    |                |                |                                    |                                      |                                    |                |                | -                                 |
|----|----------------|----------------|------------------------------------|--------------------------------------|------------------------------------|----------------|----------------|-----------------------------------|
| 5  | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>                     | n                                    | R <sup>5</sup>                     | R <sup>6</sup> | R <sup>7</sup> | R <sup>9</sup>                    |
|    | Br             | Н              | C <sub>2</sub> H <sub>5</sub>      | 2                                    | COC <sub>3</sub> H <sub>7</sub> -n | н_             | Н              | CH <sub>3</sub>                   |
|    | Br             | Н              | C <sub>2</sub> H <sub>5</sub>      | 2                                    | COC <sub>3</sub> H <sub>7</sub> n  | н              | н              | C₂H <sub>5</sub>                  |
|    | Br             | Н              | C₂H₅                               | 2                                    | COC <sub>3</sub> H <sub>7</sub> -n | н              | н              | iso-C <sub>3</sub> H <sub>7</sub> |
| 10 | Br             | Н              | C <sub>2</sub> H <sub>5</sub>      | 2                                    | COC <sub>3</sub> H <sub>7</sub> -n | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | Br             | Н              | C <sub>2</sub> H <sub>5</sub>      | 2 COC <sub>3</sub> H <sub>7</sub> -n | CH <sub>3</sub>                    |                |                |                                   |
|    | Br             | H T            | C <sub>2</sub> H <sub>5</sub>      | 2                                    |                                    | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | Br             | Н              | C <sub>2</sub> H <sub>5</sub>      | 2                                    | COCH <sub>2</sub> OCH <sub>3</sub> | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
| 15 | 8r             | н              | n-C <sub>3</sub> H <sub>7</sub>    | 0                                    | н                                  | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 15 | Br             | н              | n-C <sub>3</sub> H <sub>7</sub>    | 1                                    | Н                                  | н              | н              | CH <sub>3</sub>                   |
|    | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub>    | 1                                    | Н                                  | Н              | н              | C₂H₅                              |
|    | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub>    | 1                                    | Н                                  | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub>    | 1                                    | н                                  | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
| 20 | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub>    | 1                                    | Н                                  | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
|    | Вг             | Н              | n-C <sub>3</sub> H <sub>7</sub>    | 1                                    | Н                                  | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|    | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub>    | 2                                    | н                                  | Н              | н              | CH <sub>3</sub>                   |
|    | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub>    | 2                                    | н                                  | Н              | Н              | C₂H₅                              |
| 25 | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub>    | 2                                    | н                                  | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | Вг             | Н              | n-C <sub>3</sub> H <sub>7</sub>    | 2                                    | Н                                  | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub>    | 2                                    | Н                                  | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
|    | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub>    | 2                                    | н                                  | н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
| 30 | Br             | Н              | CH <sub>2</sub> CH=CH <sub>2</sub> | 0                                    | Н                                  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | Br             | Н              | CH <sub>2</sub> CH=CH <sub>2</sub> | 2                                    | Н                                  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | Br             | Н              | CH <sub>2</sub> F                  | 1                                    | Н                                  | Н              | Н              | CH <sub>3</sub>                   |
|    | Br             | н              | CH₂F                               | 1                                    | Н                                  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 35 | Вг             | Н              | CH₂F                               | 1                                    | Н                                  | ΗŤ             | H              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | Br             | Н              | CH <sub>2</sub> F                  | 1                                    | Н                                  | Н              | н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | <br>Вг         | Н              | CH <sub>2</sub> F                  | 1                                    | Н                                  | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
|    | Br             | Н              | CH₂F                               |                                      |                                    | Н              | н              | CH <sub>2</sub> CF <sub>3</sub>   |
| 40 | Br             | Н              | CHF <sub>2</sub>                   |                                      |                                    | H              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| 40 | Br             | Н              | CHF <sub>2</sub>                   |                                      |                                    | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|    | Br             | Н              | CHF <sub>2</sub>                   |                                      |                                    | Н              | Н              | CH <sub>3</sub>                   |
|    | Br             | Н              | CHF <sub>2</sub>                   |                                      |                                    | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
|    | Br             | Н              | CHF <sub>2</sub>                   | 0                                    |                                    | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
| 45 | Br             | Н              | CHF <sub>2</sub>                   | 1                                    | Н                                  | Н              | Н              | CH <sub>3</sub>                   |
|    | Br             | H              | CHF <sub>2</sub>                   |                                      |                                    |                | Н              | C₂H₅                              |
|    | Br             | Н              | CHF <sub>2</sub>                   |                                      |                                    | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | Br<br>Br       | Н              | CHF <sub>2</sub>                   |                                      |                                    |                |                | iso-C <sub>3</sub> H <sub>7</sub> |
| 50 | Br<br>Br       | Н              | CHF <sub>2</sub>                   |                                      |                                    |                |                | iso-C <sub>4</sub> H <sub>9</sub> |
|    | Br<br>D.       | Н              | CHF <sub>2</sub>                   | 1                                    | H                                  | Н              | Н              | CH₂CF <sub>3</sub>                |
|    | Br             | Н              | CF <sub>3</sub>                    | 0                                    | Н                                  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |

Table 1 (continued)

| 5  | $R^1$ $R^2$ | R <sup>3</sup>                    | n | R <sup>5</sup>                |   | R <sup>6</sup> | R <sup>7</sup> | R <sup>9</sup>                    |
|----|-------------|-----------------------------------|---|-------------------------------|---|----------------|----------------|-----------------------------------|
|    | Br H        | CF <sub>3</sub>                   | 0 | Н                             |   | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|    | Br H        | CF <sub>3</sub>                   | 0 | Н                             |   | Н              | Н              | CH <sub>3</sub>                   |
|    | Br H        | CF <sub>3</sub>                   | 0 | Н                             |   | н              | Н              | iso-C₄H <sub>9</sub>              |
| 10 | Br H        | CF <sub>3</sub>                   | 0 | н                             |   | Н              | Н.             | n-C <sub>4</sub> H <sub>9</sub>   |
|    | Br H        | CH₂CH₂F                           | 0 | Н                             |   | Н              | Н              | CH <sub>3</sub>                   |
|    | Br H        | CH₂CH₂F                           | 0 | н                             |   | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | Br H        | CH₂CH₂F                           | 1 | н                             |   | н              | Н              | CH <sub>3</sub>                   |
| 15 | Br H        | CH₂CH₂F                           | 1 | Н                             |   | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
| ,3 | Br H        | CH <sub>2</sub> CH <sub>2</sub> F | 1 | Н                             |   | Н              | Н              | л-С <sub>3</sub> Н <sub>7</sub>   |
|    | Br H        | CH <sub>2</sub> CH <sub>2</sub> F | 1 | Н                             |   | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | Br H        | CH₂CH₂F                           | 1 | Н                             |   | н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
|    | Вг Н        | CH₂CH₂F                           | 1 | Н                             |   | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
| 20 | Br H        | CH₂CH₂F                           | 2 | Н                             |   | Н              | Н              | CH₃ Ĭ                             |
|    | Br H        | CH <sub>2</sub> CH <sub>2</sub> F | 2 | Н                             |   | Н              | н              | C₂H₅                              |
|    | Br H        | CH <sub>2</sub> CH <sub>2</sub> F | 2 | Н                             |   | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | Br H        | CH₂CH₂F                           | 2 | н                             |   | Н              | н              | iso-C <sub>3</sub> H <sub>7</sub> |
| 25 | Br H        | CH <sub>2</sub> CH <sub>2</sub> F | 2 | н                             |   | н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
|    | Br H        | CH₂CH₂F                           | 2 | Н                             |   | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|    | Br H        | CH <sub>2</sub> CHF <sub>2</sub>  | 0 | н                             |   | Н              | н              | C <sub>2</sub> H <sub>5</sub>     |
|    | Br H        | CH <sub>2</sub> CHF <sub>2</sub>  | 0 | Н                             |   | Н              | Н              | CH <sub>3</sub>                   |
| 30 | Br H        | CH <sub>2</sub> CHF <sub>2</sub>  | 1 | Н                             |   | Н              | Н              | CH <sub>3</sub>                   |
|    | Br H        | CH <sub>2</sub> CHF <sub>2</sub>  | 1 | Н                             |   | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | Br H        | CH <sub>2</sub> CHF <sub>2</sub>  | 1 | н                             |   | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | Br H        | CH <sub>2</sub> CHF <sub>2</sub>  | 1 | Н                             |   | Н              | н              | iso-C <sub>3</sub> H <sub>7</sub> |
| 35 | Br H        | CH2CHF2                           | 1 | Н                             | · | Н              | Н              | iso-C₄H <sub>g</sub>              |
|    | Br H        | CH <sub>2</sub> CHF <sub>2</sub>  | 1 | Н                             |   | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|    | Br H        | CH <sub>2</sub> CHF <sub>2</sub>  | 2 | Н                             |   | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | Br H        | CH <sub>2</sub> CHF <sub>2</sub>  | 2 | Н                             |   | Н              | н              | CH <sub>3</sub>                   |
| 40 | Br H        | CH <sub>2</sub> CF <sub>3</sub>   | 0 | Н                             |   | н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    | Br H        | CH <sub>2</sub> CF <sub>3</sub>   | 0 | Н                             |   | Н              | Н              | CH₃                               |
|    | Br H        | CH <sub>2</sub> CF <sub>3</sub>   | 0 | C <sub>2</sub> H <sub>5</sub> |   | Н              | Н              | C₂H₅                              |
|    | Br H        | CH <sub>2</sub> CF <sub>3</sub>   | 0 | C <sub>2</sub> H <sub>5</sub> |   | Н              | Н              | CH <sub>3</sub>                   |
|    | Br H        | CH <sub>2</sub> CF <sub>3</sub>   | 1 | н                             |   | Н              | Н              | сн₃                               |
| 45 | Br H        | CH <sub>2</sub> CF <sub>3</sub>   | 1 | Н                             |   | Н              | Н              | C₂H₅                              |
|    | Br H        | CH <sub>2</sub> CF <sub>3</sub>   | 1 | Н                             |   | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>   |
|    | Br H        | CH <sub>2</sub> CF <sub>3</sub>   | 1 | Н                             |   | H              | Н              | iso-C <sub>3</sub> H <sub>7</sub> |
|    | Br H        | CH <sub>2</sub> CF <sub>3</sub>   | 1 | Н                             |   | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub> |
| 50 | Br H        | CH <sub>2</sub> CF <sub>3</sub>   | 1 | Н                             |   | Н              | Н              | CH <sub>2</sub> CF <sub>3</sub>   |
|    | Br H        | CH <sub>2</sub> CF <sub>3</sub>   | 2 | н                             |   | Н              | Н              | CH <sub>3</sub>                   |
|    | Br H        | CH <sub>2</sub> CF <sub>3</sub>   | 2 | Н                             |   | Н              | Н              | C <sub>2</sub> H <sub>5</sub>     |
|    |             |                                   |   |                               |   |                |                |                                   |

|           |                     |                |                 |   | _ \$           | Table 2<br>O      |                | -                                  |
|-----------|---------------------|----------------|-----------------|---|----------------|-------------------|----------------|------------------------------------|
| 5         | -                   |                |                 |   | R.             | N R S             |                |                                    |
| 10        |                     |                |                 | F | P P            | \$ N = CH CH CH R | S(O)n-F        | 3<br>R                             |
| 15        | R <sup>1</sup><br>F | R <sup>2</sup> | R <sup>3</sup>  |   | R <sup>5</sup> | R <sup>6</sup>    | R <sup>7</sup> | R <sup>8</sup>                     |
|           | 7                   | Н              | CH <sub>3</sub> | 0 | Н              | H                 | Н              | CH <sub>3</sub>                    |
|           | r                   | H              | CH <sub>3</sub> | 0 | H              | н                 | Н              | C <sub>2</sub> H <sub>5</sub>      |
|           | F.                  | Н              | CH <sub>3</sub> | 0 | Н              | Н                 | H              | n-C <sub>3</sub> H <sub>7</sub>    |
| 20        | F                   | Н              | CH <sub>3</sub> | 0 | Н              | Н                 | H              | iso-C <sub>3</sub> H <sub>7</sub>  |
|           | F                   | Н              | CH <sub>3</sub> | 0 | H              | н                 | Н              | n-C <sub>4</sub> H <sub>9</sub>    |
|           | F                   | H              | CH <sub>3</sub> | 0 | Н              | н                 | Н              | iso-C <sub>4</sub> H <sub>9</sub>  |
|           | F                   | Н              | CH <sub>3</sub> | 0 | Н              | Н                 | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
| 25        | F                   | Н              | CH <sub>3</sub> | 0 | H              | н                 | H              | (CH <sub>2</sub> )₃C1              |
| 23        | F                   | Н              | CH <sub>3</sub> | 0 | Н              | н                 | Н              | CH₂CN                              |
|           |                     | Н              | CH <sub>3</sub> | 0 | Н              | н                 | Н              | C <sub>6</sub> H <sub>5</sub>      |
|           | F                   | Н              | CH <sub>3</sub> | 0 | Н              | н                 | Н              | - <b>√_</b> >-cı                   |
| 30        | F                   | Н              | CH₃             | 0 | Н              | Н                 | Н              | $\neg \triangleleft$               |
|           | F                   | Н              | CH₃             | 0 | н              | Н                 | Н              | → CH3                              |
| <i>35</i> | F                   | Н              | CH <sub>3</sub> | 1 | н              | н                 | Н              | СН                                 |
|           | F                   | Н              | CH <sub>3</sub> | 1 | Н              | н                 | Н              | C <sub>2</sub> H <sub>5</sub>      |
|           | F                   | Н              | CH <sub>3</sub> | 1 | Н              | н                 | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
|           | F                   | Н              | CH <sub>3</sub> | 1 | н              | н                 | н              | iso-C₃H <sub>7</sub>               |
| 40        | F                   | Н              | CH <sub>3</sub> | 1 | н              | н                 | н              | п-С₄Н₃                             |
| 40        | F                   | H              | CH₃             | 1 | Н              | н                 | н              | iso-C <sub>4</sub> H <sub>9</sub>  |
|           | F                   | Н              | CH <sub>3</sub> | 1 | н              | н                 | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
|           | F                   | Н              | CH <sub>3</sub> | 1 | Н              | н                 | Н              | (CH <sub>2</sub> )₃Cl              |
|           | F                   | Н              | CH <sub>3</sub> | 1 | н              | н                 | Н              | CH₂CN                              |
| 45        | F                   | Н              | CH₃             | 1 | Н              | Н                 | Н              | C <sub>6</sub> H <sub>5</sub>      |
|           | F                   | н              | CH <sub>3</sub> | 1 | Н              | Н                 | Н              |                                    |
| 50        | F                   | н              | CH <sub>3</sub> | 1 | н              | н                 | н              | $\overline{}$                      |
|           | F                   | Н              | CH3             | 1 | Н              | н                 | H              | ~<br>⇔                             |

Table 2 (continued)

|    | <u>R</u> 1 | R <sup>2</sup> | R <sup>3</sup>                | n | R <sup>5</sup> | R   | s <sub>A</sub> 7 | -R8                                |
|----|------------|----------------|-------------------------------|---|----------------|-----|------------------|------------------------------------|
| 5  | F          | н              | CH <sub>3</sub>               | 2 | Н              | Н   |                  | CH₃                                |
|    | F          | Н              | CH <sub>3</sub>               | 2 | Н              | Н   | Н                | C <sub>2</sub> H <sub>s</sub>      |
|    | F          | Н              | CH <sub>3</sub>               | 2 | Н              | н   | н                | n-C <sub>3</sub> H <sub>7</sub>    |
|    | F          | Н              | CH <sub>3</sub>               | 2 | Н              | H   | Н                | iso-C <sub>3</sub> H <sub>7</sub>  |
| 10 | F          | Н              | CH₃                           | 2 | Н              | Н   | Н                | n-C <sub>4</sub> H <sub>9</sub>    |
| 10 | F          | Н              | CH <sub>3</sub>               | 2 | Н              | Н   | н                | iso-C <sub>4</sub> H <sub>9</sub>  |
|    | F          | Н              | CH <sub>3</sub>               | 2 | Н              | Н   | - H              | tert-C <sub>4</sub> H <sub>9</sub> |
|    | F          | Н              | CH <sub>3</sub>               | 2 | Н              | Н   | Н                | (CH₂)₃Cl                           |
|    | F          | Н              | CHs                           | 2 | Н              | н   | Н                | CH₂CN                              |
| 15 | F          | Н              | CH <sub>3</sub>               | 2 | Н              | н   | Н                | CeHs                               |
|    | F          | Н              | CH₃                           | 2 | н              | Н   | н                | cı                                 |
|    | F          | Н              | CH <sub>3</sub>               | 2 | Н              | н   | н                | $\overline{}$                      |
| 20 | F          | н              | СН₃                           | 2 | н              | н   | н н              | → CH3                              |
|    | F          | н              | C₂H₅                          | 0 | Н              | н   | н                | СН₃                                |
| 25 | F          | Н              | C₂Hs                          | 0 | Н              | · Н | H H              | C₂H₅                               |
|    | F          | Н              | C₂Hs                          | 0 | Н              | н   | н н              | n-C₃H <sub>7</sub>                 |
|    | F          | Н              | C₂Hs                          | 0 | Н              | H   | н н              | iso-C <sub>3</sub> H <sub>7</sub>  |
|    | F          | Н              | C₂H <sub>5</sub>              | 0 | Н              | H   | l H              | n-C₄H₂                             |
|    | F          | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | Н              | H   | I H              | iso-C₄H <sub>9</sub>               |
| 30 | F          | Н              | C₂H₅                          | 0 | Н              | F   | I H              | tert-C <sub>4</sub> H <sub>9</sub> |
|    | F          | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | Н              | ŀ   | I H              | (CH₂)₃Cl                           |
|    | F          | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | Н              | F   | i H              | CH₂CN                              |
|    | F          | Н              | C₂H₅                          | 0 | Н              | ۲   | I . H            | C <sub>6</sub> H <sub>5</sub>      |
| 35 | F          | Н              | C₂Hs                          | 0 | Н              | ۲   | н н              | — <u>—</u> —CI                     |
|    | F          | Н              | C₂H₅                          | 0 | Н              | H   | н н              | $\overline{}$                      |
| 40 | F          | Н              | C₂H₅                          | 0 | Н              | ŀ   | н н              | d √                                |
|    | F          | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | Н              | )   |                  | CH <sub>3</sub>                    |
|    | F          | Н              | C₂Hs                          | 1 | Н              | ŀ   |                  | C₂H₅                               |
| 45 | F          | Н              | C₂H₅                          | 1 | Н              | ŀ   |                  | n-CaH7                             |
|    | F          | Н              | C₂H₅                          | 1 | Н              | H   |                  | iso-C₃H <sub>7</sub>               |
|    | F          | Н              | C₂H <sub>5</sub>              | 1 | Н              | ŀ   |                  | n-C <sub>4</sub> H <sub>9</sub>    |
|    | F          | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | Н              |     | H H              | iso-C <sub>4</sub> H <sub>9</sub>  |
|    | F          | Н              | C₂H₅                          | 1 | н              |     | н н              | tert-C <sub>4</sub> H <sub>9</sub> |
| 50 | F          | Н              | C₂H₅                          | 1 | Н              |     | н н              | (CH₂)₃CI                           |
|    | F          | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | Н              | ŀ   | н н              | CH₂CN                              |

Table 2 (continued)

|                | <u>R</u> 1 | R <sup>2</sup> | R <sup>3</sup>                | n | R <sup>5</sup> | я <sup>6</sup> | R <sup>7</sup> | 8<br>8                             |
|----------------|------------|----------------|-------------------------------|---|----------------|----------------|----------------|------------------------------------|
| 5              | F          | Н              | C₂H₅                          | 1 | Н              | н              | н              | C <sub>6</sub> H <sub>5</sub>      |
|                | ۴          | Н              | C₂H₅                          | 1 | Н              | Н              | Н              | cı                                 |
| 10             | F          | н              | C <sub>2</sub> H <sub>5</sub> | 1 | н              | н              | Н              | $\overline{}$                      |
|                | F          | н              | C₂H₅                          | 1 | н              | н              | н              | CH₃                                |
| •              | F          | Н              | · C₂Hs                        | 2 | н              | Н              | Н              | СНэ                                |
| 15             | F          | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | н              | Н              | Н              | C <sub>2</sub> H <sub>5</sub>      |
|                | F          | Н              | C₂H₅                          | 2 | н              | н              | н              | n-C <sub>3</sub> H <sub>7</sub>    |
|                | F          | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | Н              | н              | Н              | iso-C₃H <sub>7</sub>               |
|                | F          | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | Н              | Н              | н              | n-C <sub>4</sub> H <sub>9</sub>    |
| 20             | F          | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | н              | н              | Н              | iso-C₄H <sub>9</sub>               |
|                | F          | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | Н              | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
|                | F          | Н              | C₂H₅                          | 2 | н              | Н              | н              | (CH₂)₃CI                           |
|                | F          | Н              | C₂H₅                          | 2 | Н              | Н              | Н              | CH₂CN                              |
| 25             | F          | Н              | C₂H₅                          | 2 | Н              | Н              | Н              | C <sub>6</sub> H <sub>5</sub>      |
|                | F          | Н              | C₂H₅                          | 2 | н              | н              | Н              | CI                                 |
|                | F          | Н              | C₂H₅                          | 2 | Н              | н              | Н              | $\overline{}$                      |
| 30             | F          | н              | C <sub>2</sub> H <sub>5</sub> | 2 | н              | н              | н              | CH <sub>3</sub>                    |
|                | C1         | Н              | CH₃<br>CH₃                    | 0 | Н              | Н              | Н              | Н                                  |
|                | CI         | Н              |                               | 0 | Н              | н              | Н              | СН                                 |
| 35             | CI         | Н              | CH <sub>3</sub>               | 0 | Н              | Н              | н              | C <sub>2</sub> H <sub>5</sub>      |
|                | CI         | Н              | CH <sub>3</sub>               | 0 | н              | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
|                | CI         | Н              | CH <sub>3</sub>               | 0 | Н              | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>  |
|                | CI         | Н              | CH <sub>3</sub>               | 0 | Н              | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>    |
| 40             | CI         | Н              | CH <sub>3</sub>               | 0 | Н              | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>  |
| 70             | ~ CI       | Н              | CH <sub>3</sub>               | 0 | Н              | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>  |
|                | CI         | Н              | CH <sub>3</sub>               | 0 | н              | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
|                | CI         | Н              | CH <sub>3</sub>               | 0 | Н              | Н              | Н              | n-CsH <sub>11</sub>                |
|                | CI         | Н              | CH <sub>3</sub>               | 0 | н              | Н              | Н              | n-CeH <sub>13</sub>                |
| 45             | CI         | Н              | CH₃                           | 0 | Н              | Н              | Н              | CeHs                               |
|                | CI         | Н              | CH₃                           | 0 | Н              | Н              | Н              | <b>─</b> F                         |
| 50             | CI         | Н              | CH <sub>3</sub>               | 0 | н              | н              | н              | - <b>C</b> I                       |
| - <del>-</del> | CI         | н              | CH <sub>3</sub>               | 0 | н              | н              | н              | —(_>_CI<br>—(>_Br                  |

EP 0 742 202 A2

Table 2 (continued)

|    | R <sup>1</sup> | R <sup>2</sup> | A <sup>3</sup>  | n | R <sup>5</sup> | R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>                      |
|----|----------------|----------------|-----------------|---|----------------|----------------|----------------|-------------------------------------|
| 5  | CI ·           | Н              | CH3             | 0 | Н              | Н              | Н              | -(_>-CH <sub>3</sub>                |
|    | CI             | н              | CH3             | 0 | н              | H              | н              |                                     |
| 10 | CI             | н              | CH <sub>3</sub> | 0 | н              | н              | Н              | CN                                  |
|    | CI             | Н              | CH₃             | 0 | Н              | н              | н              | NO <sub>2</sub>                     |
| 15 | CI             | н              | CH <sub>3</sub> | 0 | Н              | н              | Н              | — <u>~</u> —осн <sub>3</sub>        |
|    | CI             | Н              | CH3             | 0 | Н              | H              | н              | — <u></u> _>-scн <sub>3</sub>       |
|    | CI             | Н              | CH₃             | 0 | Н              | Ħ              | н              | CH=CH₂                              |
| 20 | CI             | Н              | CH <sub>3</sub> | 0 | Н              | H              | Н              | CH=CHC6Hs                           |
|    | CI             | Н              | CH <sub>3</sub> | 0 | н              | H              | н              | CH=CHCH3                            |
|    | CI             | Н              | CH <sub>3</sub> | 0 | Н              | н              | н              | C(=CH <sub>2</sub> )CH <sub>3</sub> |
|    | CI             | Н              | CH <sub>3</sub> | 0 | Н              | н              | Н              | CH <sub>2</sub> CF=CF <sub>2</sub>  |
| 25 | CI             | н              | CH <sub>3</sub> | 0 | Н              | Н              | Н              | -CH2-(_)-CI                         |
|    | CI             | Н              | CH₃             | 0 | Н              | н              | Н              | CH2CH2CI                            |
|    | CI             | Н              | CH <sub>3</sub> | 0 | Н              | н              | н              | (CH₂)₄CI                            |
|    | CI             | Н              | CH <sub>3</sub> | 0 | Н              | н              | н              | (CH₂)₃CI                            |
| 30 | CI             | Н              | CH <sub>3</sub> | 0 | Н              | н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>    |
|    | CI             | Н              | CH <sub>3</sub> | 0 | Н              | н              | н              | CH2CH2OCH3                          |
|    | CI             | Н              | CH <sub>3</sub> | 0 | Н              | н              | н              | CH₂CN                               |
|    | CI             | Н              | CH <sub>3</sub> | 0 | Н              | н.             | Н              | CH2CO2C2Hs                          |
| 35 | CI             | н              | CH <sub>3</sub> | 0 | Н              | н              | н              | -CH2-O-(_)                          |
|    | CI             | Н              | CH <sub>3</sub> | 0 | Н              | Н              | Н              | $\overline{}$                       |
| 40 | CI             | Н              | CH₃             | 0 | н              | н              | н              | <br>CH₃.                            |
|    | CI             | н              | CH3             | 0 | Н              | н              | н              | $\overline{}$                       |
| 45 | CI             | н              | CH <sub>3</sub> | 0 | Н              | Н              | Н              | $\overline{}$                       |
|    | CI             | Н              | CH <sub>3</sub> | 0 | Н              | 2-CI           | н              | CH <sub>3</sub>                     |
|    | CI             | Н              | CH <sub>3</sub> | 0 | н              | 2-C1           | н              | C₂H₅                                |
| F0 | CI             | Н              | CH <sub>3</sub> | 0 | Н              | 2-CI           | Н              | n-CaH7                              |
| 50 | CI             | Н              | CH <sub>3</sub> | 0 | Н              | 2-C1           | н              | n-C₄H₀                              |
|    | CI             | Н              | CH <sub>3</sub> | 0 | Н              | 3-C1           | Н              | CH₃                                 |
|    |                |                |                 |   |                |                |                |                                     |

Table 2 (continued)

|    | R <sup>1</sup> | я <sup>2</sup> | A3                | n | R <sup>5</sup>                | R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>  |
|----|----------------|----------------|-------------------|---|-------------------------------|----------------|----------------|---|
| 5  | CI             | Н              | CH <sub>3</sub>   | 0 | Н                             | <br>3-CI       | Н              | C <sub>2</sub> H <sub>s</sub>                                 |
|    | CI             | Н              | CH <sub>3</sub>   | 0 | Н                             | 3-C1           | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|    | CI             | Н              | CH <sub>3</sub>   | 0 | Н                             | 3-C1           | Н              | n-C₄H₀  |
|    | CI             | Н              | CH <sub>3</sub>   | 0 | н                             | 2-F            | н              | CH <sub>3</sub>   |
| 10 | CI             | Н              | CH <sub>3</sub>   | 0 | н                             | 2-F            | Н              | C₂Hs  |
|    | CI             | Н              | CH <sub>3</sub>   | 0 | Н                             | 2-F            | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|    | CI             | Н              | CH <sub>3</sub>   | 0 | Н                             | 2-F            | Н              | n-C4He  |
| •  | CI             | Н              | . CH <sub>3</sub> | 0 | Н                             | 3-F            | Н              | CH <sub>3</sub>   |
| •  | CI             | Н              | CH <sub>3</sub>   | 0 | Н                             | 3-F            | Н              | C₂Hs  |
| 15 | CI             | Н              | CH <sub>3</sub>   | 0 | Н                             | 3-F            | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|    | CI             | Н              | CH₃               | 0 | Н                             | 3-F            | Н              | n-C₄H₀  |
|    | CI             | Н              | CH <sub>3</sub>   | 0 | Н                             | 3-F            | Н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
|    | CI             | Н              | CH <sub>3</sub>   | 0 | CH <sub>3</sub>               | н              | н              | CH <sub>3</sub>   |
| 20 | CI             | Н              | CH <sub>3</sub>   | 0 | CH <sub>3</sub>               | н              | Н              | C₂Hs  |
| 20 | CI             | Н              | CH <sub>3</sub>   | 0 | CH <sub>3</sub>               | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|    | CI             | Н              | CH <sub>3</sub>   | 0 | CH <sub>3</sub>               | Н              | Н              | iso-C₃H <sub>7</sub>  |
|    | CI             | Н              | CH₃               | 0 | CH <sub>3</sub>               | Н              | Н              | n-C₄H₃  |
|    | CI             | Н              | CH <sub>3</sub>   | 0 | CH <sub>3</sub>               | H              | Н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
| 25 | CI             | Н              | CH <sub>3</sub>   | 0 | CH <sub>3</sub>               | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | CI             | Н              | CH3               | 0 | CH <sub>3</sub>               | н              | н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
|    | CI             | Н              | CH₃               | 0 | CH <sub>3</sub>               | н              | Н              | CeHs  |
|    | CI             | Н              | CH <sub>3</sub>   | 0 | CH <sub>3</sub>               | Н              | Н              | - <b>C</b> I  |
| 30 | CI             | н              | СНэ               | 0 | CH <sub>3</sub>               | н              | н              | (CH₂)₃CI  |
|    | CI             | н              | CH <sub>3</sub>   | Ö | CH <sub>3</sub>               | н              | Н              | (CH₂)₄CI  |
|    | CI             | н              | CH <sub>3</sub>   | Ō | CH <sub>3</sub>               | Н              | Н              | CH₂CN   |
|    | CI             | Н              | CH <sub>3</sub>   | 0 | CH <sub>3</sub>               | H              | →H             | CH2OCH3   |
| 35 | CI             | Н              | CH <sub>3</sub>   | Ö | CHs                           | Н              | н              | CH2CO2C2H5  |
|    | CI             | Н              | CH <sub>3</sub>   | 0 | C <sub>2</sub> H <sub>5</sub> | Н              | н              |   |
|    | CI             | н              | СН₃               | 0 | C <sub>2</sub> H <sub>5</sub> | н              | н              | CH <sub>3</sub>   |
|    | CI             | H              | CH <sub>3</sub>   | 0 | C₂Hs                          | н              | Н              | C <sub>2</sub> Hs   |
| 40 | CI             | Н              | CH <sub>3</sub>   | 0 | C₂H5                          | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|    | CI             | Н              | CH <sub>3</sub>   | 0 | C₂H₅                          | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
|    | CI             | н              | CH <sub>3</sub>   | 0 | C₂H₅                          | н              | н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|    | CI             | Н              | CH <sub>3</sub>   | 0 | C₂H₅                          | Н              | Н              | iso-C₄H₃  |
| 45 | CI             | н              | CH₃               | 0 | C₂H₅                          | н              | н              | sec-C <sub>4</sub> H <sub>e</sub>                             |
|    | CI             | Н              | CH <sub>3</sub>   | 0 | C₂H₅                          | н              | н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | CI             | Н              | CHs               | 0 | C₂Hs                          | н              | н              | (CH2)3CI  |
|    | CI             | Н              | CH <sub>3</sub>   | 0 | C₂H₅                          | н              | н              | (CH <sub>2</sub> ) <sub>4</sub> Cl                            |
|    | CI             | н              | CH <sub>3</sub>   | 0 | C₂H₅                          | н              | н              | CH₂CN   |
| 50 | CI             | Н              | CH <sub>3</sub>   | 0 | C₂H₅                          | н              | н              | CH₂OCH₃   |
|    | CI             | Н              | CH <sub>3</sub>   | 0 | C <sub>2</sub> H <sub>5</sub> | н              | н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |

Table 2 (continued)

| _    | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>  | ก   | R <sup>5</sup>                                 | R <sup>6</sup> | R <sup>7</sup> | R8                                 |
|------|----------------|----------------|-----------------|-----|--|----------------|----------------|------------------------------------|
| 5    | CI.            | Н              | CH <sub>3</sub> | 0   | C <sub>2</sub> H <sub>5</sub>                  | Н              | Н              | CeHs                               |
|      | CI             | Н              | CH <sub>3</sub> | 0   | n-C₃H7   | Н              | Н              | - <b>√_</b> >-CI                   |
|      | CI             | Н              | CH <sub>3</sub> | 0   | n-C <sub>3</sub> H <sub>7</sub>                | Н              | н              | CH₃                                |
| 10   | CI             | Н              | CH3             | 0   | n-C₃H₁   | Н              | Н              | C <sub>2</sub> H <sub>5</sub>      |
|      | CI             | Н              | CH3             | 0   | n-C <sub>3</sub> H <sub>7</sub>                | Н              | Н              | n-C₃H7                             |
|      | CI             | Н              | CH <sub>3</sub> | 0   | n-C <sub>3</sub> H <sub>7</sub>                | Н              | Н              | iso-C₃H <sub>7</sub>               |
|      | CI             |                | CH <sub>3</sub> | - 0 | n-C <sub>3</sub> H <sub>7</sub>                | Н              | Н              | π-C₄H <sub>9</sub>                 |
| 15   | CI             | Н              | CH <sub>3</sub> | 0   | n-C <sub>3</sub> H <sub>7</sub>                | H              | Н              | iso-C₄H₀                           |
| 75   | CI             | Н              | CH <sub>3</sub> | 0   | n-C <sub>3</sub> H <sub>7</sub>                | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>  |
|      | CI             | Н              | CH₃             | 0   | n-C <sub>3</sub> H <sub>7</sub>                | Н              | H              | tert-C <sub>4</sub> H <sub>9</sub> |
|      | CI             | Н              | CH <sub>3</sub> | 0   | n-C <sub>3</sub> H <sub>7</sub>                | Н              | Н              | (CH₂)₃CI                           |
| -    | CI             | Н              | CH₃             | 0   | n-C <sub>3</sub> H <sub>7</sub>                | Н              | Н              | (CH₂)₄Cl                           |
| 20   | CI             | Н              | CH <sub>3</sub> | 0   | n-C <sub>3</sub> H <sub>7</sub>                | Н              | Н              | CH₂CN                              |
|      | CI             | Н              | CH <sub>3</sub> | 0   | n-C₃H₂   | Н              | Н              | CH2CO2C2H5                         |
|      | CI             | Н              | CH₃             | 0   | n-C <sub>3</sub> H <sub>7</sub>                | Н              | Н              | CH2OCH3                            |
|      | CI             | Н              | CH <sub>3</sub> | 0   | n-C <sub>3</sub> H <sub>7</sub>                | Н              | Н              | C <sub>6</sub> H <sub>5</sub>      |
| 25   | CI             | Н              | CH <sub>3</sub> | 0   | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | CH₃                                |
| 20   | CI             | Н              | CH <sub>3</sub> | 0   | iso-C₃H <sub>7</sub>                           | Н              | Н              | C <sub>2</sub> H <sub>5</sub>      |
|      | CI             | Н              | CH <sub>3</sub> | 0   | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
|      | CI             | Н              | CH <sub>3</sub> | 0   | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>  |
|      | CI             | н              | CH <sub>3</sub> | 0   | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | n-C₄H₃                             |
| 30   | CI             | Н              | CH₃             | 0   | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>  |
|      | CI             | Н              | CH <sub>3</sub> | 0   | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>  |
|      | CI             | Н              | CH₃             | 0   | iso-C₃H <sub>7</sub>                           | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
|      | CI             | Н              | CH <sub>3</sub> | 0   | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | (CH₂)₃CI                           |
| 35   | CI             | H              | CH <sub>3</sub> | 0   | iso-C <sub>3</sub> H <sub>7</sub>              | н -            | Н              | (CH₂)₄CI                           |
|      | CI             | Н              | CH <sub>3</sub> | 0   | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | CH₂CN                              |
|      | CI             | Н              | CH <sub>3</sub> | 0   | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              |                                    |
|      | CI             | Н              | CH3             | 0   | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | CH₂OCH₃                            |
|      | CI             | Н              | CH₃             | 0   | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              | C <sub>6</sub> H <sub>5</sub>      |
| 40 ~ | CI             | Н              | CH <sub>3</sub> | 0   | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н              |                                    |
|      | CI             | Н              | CH <sub>3</sub> | 0   | CH₂OCH₃  | н              | н              | CH₃                                |
|      | CI             | Н              | CH <sub>3</sub> | 0   | CH2OCH3  | Н              | Н              | C <sub>6</sub> H <sub>5</sub>      |
| 45   | CI             | Н              | CH₃             | 0   | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | CH <sub>3</sub>                    |
|      | C)             | Н              | CH <sub>3</sub> | 0   | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | H              | Н              | C <sub>6</sub> H <sub>5</sub>      |
|      | CI             | Н              | CH <sub>3</sub> | 0   | CH₂SCH₃  | Н              | H              | CH <sub>3</sub>                    |
|      | CI             | Н              | CH <sub>3</sub> | 0   | CH₂SCH₃  | Н              | Н              | CeHs                               |
|      | CI             | Н              | CH <sub>3</sub> | 0   | COCH <sub>3</sub>                              | Н              | Н              | CH₃                                |
| 50   | CI             | Н              | CH <sub>3</sub> | 0   | COC₂H₅   | Н              | Н              | CHs                                |
|      | ĊI             | Н              | CH <sub>3</sub> | 0   | COC₂Hs   | Н              | н              | C₂Hs                               |
|      | CI             | Н              | CH <sub>3</sub> | 1   | н  | Н              | Н              | CH <sub>3</sub>                    |

Table 2 (continued)

|           | <u>R</u> 1 | R <sup>2</sup> | <b>8</b> 3.       | n | R <sup>5</sup>                | R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>  |
|-----------|------------|----------------|-------------------|---|-------------------------------|----------------|----------------|---|
| 5         | CI.        | Н              | CH <sub>3</sub>   | 1 | Н                             | <br>н          | Н              | C₂Hs  |
|           | CI         | Н              | CH <sub>3</sub>   | 1 | н                             | H              | Н              | n-C₃H <sub>7</sub>  |
|           | CI         | н              | CH <sub>3</sub>   | 1 | н                             | H              | Н              | iso-C₃H <sub>7</sub>  |
|           | CI         | Н              | CH <sub>3</sub>   | 1 | Н                             | H              | н              | n-C <sub>4</sub> H <sub>9</sub>                               |
| 10        | CI         | Н              | CH <sub>3</sub>   | 1 | н                             | H              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
| 70        | CI         | н              | CH <sub>3</sub>   | 1 | Н                             | H              | Н              | tert-C₄H₃   |
|           | CI         | Н              | CH <sub>3</sub>   | 1 | Н                             | H              | Н              | (CH₂)₃CI  |
|           | CI         | Н              | . CH <sub>3</sub> | 1 | Н                             | <b>H</b> -     | н              | CH₂CN   |
|           | CI         | Н              | CH <sub>3</sub>   | 1 | Н                             | H              | Н              | CH <sub>2</sub> OCH₃  |
| 15        | CI         | Н              | CH <sub>3</sub>   | 1 | н                             | H              | н              |   |
|           | CI         | н              | CH <sub>3</sub>   | 1 | Н                             | H              | Н              | $\overline{}$   |
|           |            |                |                   |   |                               |                |                |   |
|           | CÎ         | н              | СН₃               | 1 | н                             | H              | н              | /CH3  |
| 20        | ٠.         | • •            | J                 | • | ••                            |                |                | $\overline{}$   |
|           | CI         | н              | CH <sub>3</sub>   | 1 | н                             | н              | н              | C <sub>6</sub> H <sub>5</sub>                                 |
|           | CI         | н              | CH <sub>3</sub>   | 1 | н                             | н              | н              |   |
|           | Ci         | ••             | 01.13             | • | ••                            | • •            |                | (_)-CI  |
| 25        | CI         | H              | CH <sub>3</sub>   | 1 | Н                             | 2-CI           | Н              | C <sub>2</sub> H <sub>5</sub>                                 |
|           | CI         | Н              | CH₃               | 1 | Н                             | 3-CI           | Н              | CH <sub>3</sub>   |
|           | CI         | Н              | CH <sub>3</sub>   | 1 | CH <sub>3</sub>               | H              | н              | CH <sub>3</sub>   |
|           | CI         | Н              | CH <sub>3</sub>   | 1 | CHs                           | H              | Н              | C <sub>2</sub> H <sub>5</sub>                                 |
| 30        | CI         | Н              | CH <sub>3</sub>   | 1 | CH <sub>3</sub>               | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
| 30        | CI         | Н              | CH₃               | 1 | CH <sub>3</sub>               | H              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
|           | CI         | Н              | CH <sub>3</sub>   | 1 | CH₃                           | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|           | CI         | Н              | CH <sub>3</sub>   | 1 | CH <sub>3</sub>               | н              | Н              | iso-C₄H₃  |
|           | CI         | Н              | CH <sub>3</sub>   | 1 | CH₃                           | Н              | - H            | sec-C <sub>4</sub> H <sub>9</sub>                             |
| <i>35</i> | CI         | Н              | CH <sub>3</sub>   | 1 | CH₃                           | н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|           | CI         | Н              | CH₃               | 1 | CH₃                           | н              | н              | (CH₂)₃CI  |
|           | CI         | Н              | CH3               | 1 | CH <sub>3</sub>               | H              | Н              | (CH₂)₄CI  |
|           | CI         | Н              | CH <sub>3</sub>   | 1 | CH <sub>3</sub>               | H              | Н              | CH₂CN   |
| 40        | CI         | Н              | CH₃               | 1 | CH <sub>3</sub>               | H              | Н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
| •         | CI         | Н              | CH <sub>3</sub>   | 1 | CH <sub>3</sub>               | H              | Н              | CH <sub>2</sub> OCH <sub>3</sub>                              |
|           | CI         | н              | CH <sub>3</sub>   | 1 | CH <sub>3</sub>               | H              | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
|           | CI         | Н              | CH <sub>3</sub>   | 1 | CH <sub>3</sub>               | H              | Н              |   |
| 45        | CI         | н              | СН₃               | 1 | C₂H₅                          | н              | Н              | CH <sub>3</sub>   |
|           | CI         | н              | CH <sub>3</sub>   | 1 | C₂H5                          | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                                 |
|           | CI         | Н              | CH <sub>3</sub>   | 1 | C <sub>2</sub> H <sub>5</sub> | н              | н              | n-CaH7  |
|           | CI         | н              | CH <sub>3</sub>   | 1 | C₂H <sub>5</sub>              | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
| 50        | CI         | н              | CH <sub>3</sub>   | 1 | C <sub>2</sub> H <sub>5</sub> | Н              | н              | n-CaHe  |
| <i>50</i> | CI         | н              | CH <sub>3</sub>   | 1 | C₂Hs                          | н              | н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
|           | CI         | н              | CH <sub>3</sub>   | 1 | C₂Hs                          | н              | н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
|           |            | - •            |                   | • |                               | · •            | -              | · · · · · · ·   |

Table 2 (continued)

|    | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>    | n | R <sup>5</sup>                    | R <sup>6</sup> | R <sup>7</sup> |   |
|----|----------------|----------------|-------------------|---|-----------------------------------|----------------|----------------|---|
| 5  | CI.            | Н              | CH <sub>3</sub>   | 1 | C <sub>2</sub> H <sub>5</sub>     | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | CI             | Н              | CH <sub>3</sub>   | 1 | C <sub>2</sub> H <sub>5</sub>     | н              | Н              | (CH₂)₃CI  |
|    | CI             | Н              | CH <sub>3</sub>   | 1 | C <sub>2</sub> H <sub>5</sub>     | н              | Н              | (CH₂)₄Cl  |
|    | CI             | Н              | CH <sub>3</sub>   | 1 | C <sub>2</sub> H <sub>5</sub>     | H              | Н              | CH₂CN   |
| 10 | CI             | Н              | CH <sub>3</sub>   | 1 | C <sub>2</sub> H <sub>5</sub>     | н              | Н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | CI             | Н              | CH₃               | 1 | C <sub>2</sub> H <sub>5</sub>     | н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>                              |
|    | CI             | Н              | CH <sub>3</sub>   | 1 | C <sub>2</sub> H <sub>5</sub>     | н              | н              | C <sub>6</sub> H <sub>5</sub>                                 |
|    | CI             |                | - CH <sub>3</sub> | 1 | C <sub>2</sub> H <sub>5</sub>     | Н              | Н              | (T)   |
| •  | ٥.             | ••             | J. 13             | • | 02/15                             | ••             | • • •          | -(-)-(1   |
| 15 | CI             | Н              | CH <sub>3</sub>   | 1 | n-C <sub>3</sub> H <sub>7</sub>   | H              | Н              | CH₃   |
|    | CI             | Н              | CH <sub>3</sub>   | 1 | n-C <sub>3</sub> H <sub>7</sub>   | н              | Н              | C₂H₅  |
|    | CI             | н              | CH₃               | 1 | n-C₃H₂                            | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|    | CI             | Н              | CH <sub>3</sub>   | 1 | n-CsH7                            | H              | н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
| 20 | CI             | н              | CH <sub>3</sub>   | 1 | n-C <sub>3</sub> H <sub>7</sub>   | н              | н              | n-C₄H₀  |
|    | CI             | Н              | СН₃               | 1 | n-C <sub>3</sub> H <sub>7</sub>   | н              | Н              | iso-C₄H₃  |
|    | CI             | Н              | CH <sub>3</sub>   | 1 | n-C <sub>2</sub> H <sub>7</sub>   | н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
|    | CI             | Н              | CH₃               | 1 | n-C <sub>3</sub> H <sub>7</sub>   | н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | CI             | Н              | CH <sub>3</sub>   | 1 | n-C <sub>3</sub> H <sub>7</sub>   | н              | Н              | (CH <sub>2</sub> ) <sub>3</sub> Cl                            |
| 25 | CI             | Н              | CH₃               | 1 | n-C <sub>3</sub> H <sub>7</sub>   | н              | н              | (CH₂)₄CI  |
|    | CI             | Н              | CH <sub>3</sub>   | 1 | n-CsH7                            | н              | Н              | CH₂CN   |
|    | CI             | Н              | CH <sub>3</sub>   | 1 | n-C <sub>2</sub> H <sub>7</sub>   | н              | Н              | CH2CO2C2H5  |
|    | CI             | Н              | CH₃               | 1 | n-C <sub>3</sub> H <sub>7</sub>   | н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>                              |
| 30 | CI             | Н              | CH₃               | 1 | n-C₃H <sub>7</sub>                | н              | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
|    | CI             | н              | CH₃               | 1 | n-CaH7                            | н              | н              | -CI   |
|    |                |                |                   |   |                                   |                |                |   |
|    | CI             | Н              | CH <sub>3</sub>   | 1 | iso-C₃H <sub>7</sub>              | н              | Н              | CH <sub>3</sub>   |
| 35 | CI             | Н              | CH <sub>3</sub>   | 1 | iso-C₃H <sub>7</sub>              | н -            | Н              | C₂Hs  |
|    | CI             | Н              | CH <sub>3</sub>   | 1 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | n-CaH7  |
|    | CI             | Н              | CH₃               | 1 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
|    | CI             | Н              | CH <sub>3</sub>   | 1 | iso-C₃H <sub>7</sub>              | н              | Н              | n-CaH <sub>9</sub>  |
|    | CI             | Н              | CH <sub>3</sub>   | 1 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
| 40 | CI             | Н              | CH <sub>3</sub>   | 1 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
|    | CI             | Н              | CH₃               | 1 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | CI             | н              | CH₃               | 1 | iso-C₃H7                          | н              | Н              | (CH₂)₃CI  |
|    | CI             | Н              | CH₃               | 1 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | (CH₂)₄CI  |
| 45 | CI             | Н              | CH₃               | 1 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | CH₂CN   |
|    | CI             | Н              | CH₃               | 1 | iso-C₃H7                          | н              | Н              | CH2CO2C2H5  |
|    | CI             | Н              | CH <sub>3</sub>   | 1 | iso-C₃H7                          | Н              | Н              | CH <sub>2</sub> OCH₃  |
|    | CI             | Н              | CH <sub>3</sub>   | 1 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
| 50 | CI             | Н              | CH <sub>3</sub>   | 1 | iso-C₃H7                          | н              | Н              | (-)-cı  |
| 50 | ~.             |                | ٠                 | _ |                                   |                |                |   |
|    | CI             | Н              | CH₃               | 2 | Н                                 | н              | Н              | CH <sub>2</sub>   |
|    | CI             | Н              | CH₃               | 2 | H                                 | н              | Н              | C₂H₅  |

Table 2 (continued)

|    | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>    | n | R <sup>5</sup>                | R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>  |
|----|----------------|----------------|-------------------|---|-------------------------------|----------------|----------------|---|
| 5  | CI.            | Н              | CH <sub>3</sub>   | 2 | Н                             | <br>Н          | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|    | CI             | Н              | CH <sub>3</sub>   | 2 | Н                             | н              | н              | iso-C₃H <sub>7</sub>  |
|    | CI             | Н              | CH <sub>3</sub>   | 2 | н                             | н              | н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|    | CI             | н              | СН₃               | 2 | н                             | Н              | н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
| 10 | CI             | Н              | СН₃               | 2 | н                             | н              | н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
| 10 | CI             | Н              | CH <sub>3</sub>   | 2 | н                             | н              | н              | (CH₂)₃Cl  |
|    | CI             | Н              | CH <sub>3</sub>   | 2 | н                             | н              | Н              | CH₂CN   |
|    | CI             | Н              | . CH <sub>3</sub> | 2 | н                             | н              | Н              | CH <sub>2</sub> OCH₃  |
| •  | CI             | Н              | CH <sub>3</sub>   | 2 | Н                             | н              | Н              | CH2CO2C2H5  |
| 15 | CI             | Н              | CH <sub>3</sub>   | 2 | н                             | Н              | Н              | _1  |
|    |                |                |                   |   |                               |                |                | 7   |
|    | ÇI             | н              | CH₃               | 2 | н                             | H              | н              | _CH₃<br>  |
|    |                |                |                   |   |                               |                |                | $\overline{}$   |
| 20 | CI             | Н              | CH <sub>3</sub>   | 2 | Н                             | Н              | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
|    | CI             | Н              | CH <sub>3</sub>   | 2 | Н                             | Н              | н              | -√_>-cı   |
|    |                |                |                   |   |                               |                |                | <u>_</u>  |
|    | CI             | Н              | CH <sub>3</sub>   | 2 | Н                             | 2-CI           | Н              | C <sub>2</sub> H <sub>s</sub>                                 |
| 25 | CI             | Н              | CH₃               | 2 | Н                             | 3-C1           | Н              | C₂H <sub>5</sub>  |
|    | CI             | Н              | СН₃               | 2 | CH₃                           | н              | Н              | CH₃   |
|    | CI             | н              | CH <sub>3</sub>   | 2 | CH3                           | Н              | Н              | C₂H₅  |
|    | CI             | Н              | CH₃               | 2 | CH₃                           | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
| 30 | CI             | Н              | CH <sub>3</sub>   | 2 | CH₃                           | Н              | н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
|    | CI             | Н              | CH₃               | 2 | CH₃                           | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|    | CI             | Н              | CH <sub>3</sub>   | 2 | CH <sub>3</sub>               | н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
|    | CI             | Н              | CH₃               | 2 | CH₃                           | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
|    | CI             | Н              | CH₃               | 2 | CH <sub>3</sub>               | Н              | - H            | tert-C <sub>4</sub> H <sub>9</sub>                            |
| 35 | CI             | Н              | CH₃               | 2 | CH <sub>3</sub>               | Н              | Н              | (CH₂)₃CI  |
|    | CI             | Н              | CH₃               | 2 | CH <sub>3</sub>               | Н              | Н              | (CH₂)₄CI  |
|    | CI             | Н              | CH₃               | 2 | CH₃                           | Н              | Н              | CH₂CN   |
|    | CI             | Н              | CH <sub>3</sub>   | 2 | CH₃                           | H              | Н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
| 40 | CI             | Н              | СНз               | 2 | CH <sub>2</sub>               | Н              | Н              | CH₂OCH₃   |
|    | CI             | Н              | CH <sub>3</sub>   | 2 | CH <sub>3</sub>               | Н              | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
|    | CI             | Н              | CH₃               | 2 | CH₃                           | Н              | Н              | (>-cı   |
|    | CI             | Н              | CH <sub>3</sub>   | 2 | C₂H₅                          | Н              | н              | СН₃   |
| 45 | CI             | Н              | CH <sub>3</sub>   | 2 | C₂H₅                          | Н              | Н              | C₂H₅  |
|    | CI             | Н              | CH <sub>3</sub>   | 2 | C₂H₅                          | н              | Н              | n-C₃H₂  |
|    | CI             | Н              | CH <sub>3</sub>   | 2 | C₂Hs                          | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
|    | CI             | Н              | CH <sub>3</sub>   | 2 | C <sub>2</sub> H <sub>5</sub> | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
| 50 | CI             | Н              | CH <sub>3</sub>   | 2 | C <sub>2</sub> H <sub>5</sub> | Н              | Н              | iso-C₄H₂  |
|    | CI             | Н              | CH <sub>3</sub>   | 2 | C₂H₅                          | Н              | н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
|    | CI             | Н              | CH <sub>3</sub>   | 2 | C₂H₅                          | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |

Table 2 (continued)

|           | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>                | n | R <sup>5</sup>                    | R <sup>6</sup> | R <sup>7</sup> |                                     |
|-----------|----------------|----------------|-------------------------------|---|-----------------------------------|----------------|----------------|-------------------------------------|
| 5         | Ci ,           | Н              | CH <sub>3</sub>               | 2 | C₂Hs                              | Н              | Н              | (CH₂)₃CI                            |
|           | CI             | Н              | CH <sub>3</sub>               | 2 | C₂Hs                              | Н              | Н              | (CH₂)₄CI                            |
|           | CI             | Н              | CH₃                           | 2 | C₂H₅                              | н              | н              | CH₂CN                               |
|           | CI             | Н              | CH <sub>3</sub>               | 2 | C2H5                              | Н              | Н              | CH2CO2C2Hs                          |
| 10        | CI             | H              | CH <sub>3</sub>               | 2 | C <sub>2</sub> H <sub>5</sub>     | Н              | Н              | CH <sub>2</sub> OCH₃                |
|           | CI             | Н              | CH₃                           | 2 | C <sub>2</sub> Hs                 | Н              | Н              | C <sub>6</sub> H <sub>5</sub>       |
|           | CI             | Н              | CH₃                           | 2 | C₂H₅                              | н              | Н              | cı                                  |
|           | CI             | Н              | CH <sub>3</sub>               | 2 | n-C <sub>3</sub> H <sub>7</sub>   | н              | Н              | CH <sub>3</sub>                     |
| 15        | CI             | H              | CH <sub>3</sub>               | 2 | n-C <sub>3</sub> H <sub>7</sub>   | н              | н              | C₂H₅                                |
|           | CI             | Н              | CH <sub>3</sub>               | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>     |
|           | CI             | Н              | CH₃                           | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | iso-C₃H <sub>7</sub>                |
|           | CI             | Н              | CH <sub>3</sub>               | 2 | n-C₃H₂                            | Н              | Н              | n-C₄H₃                              |
| 20        | CI             | Н              | CH <sub>3</sub>               | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>   |
| 20        | CI             | Н              | CH <sub>3</sub>               | 2 | n-C₃H₂                            | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>   |
|           | CI             | Н              | CH₃                           | 2 | n-C <sub>3</sub> H <sub>7</sub>   | н              | Н              | tert-C₄H₃                           |
|           | CI             | Н              | CH <sub>3</sub>               | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | (CH₂)₃CI                            |
|           | CI             | Н              | CH₃                           | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | (CH₂)₄CI                            |
| 25        | CI             | Н              | CH <sub>3</sub>               | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | CH₂CN                               |
|           | CI             | Н              | CH₃                           | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | CH2CO2C2H5                          |
|           | CI             | Н              | CH <sub>3</sub>               | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | CH₂OCH₃                             |
|           | CI             | Н              | CH₃                           | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | C <sub>6</sub> H <sub>5</sub>       |
| 30        | CI             | Н              | CH <sub>3</sub>               | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              |                                     |
|           | CI             | Н              | CH₃                           | 2 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | CH <sub>3</sub>                     |
|           | CI             | Н              | CH₃                           | 2 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | C₂H₅                                |
|           | CI             | Н              | CH <sub>3</sub>               | 2 | iso-C₃H <sub>7</sub>              | н -            | Н              | n-C <sub>3</sub> H <sub>7</sub> *** |
| <i>35</i> | CI             | Н              | CH <sub>3</sub>               | 2 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>   |
|           | CI             | Н              | CH₃                           | 2 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>     |
|           | CI             | Н              | CH <sub>3</sub>               | 2 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>   |
|           | CI             | Н              | CH <sub>3</sub>               | 2 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>   |
| 40 ~      | CI             | Н              | CH <sub>3</sub>               | 2 | iso-C <sub>3</sub> H <sub>7</sub> | н              | н              | tert-C <sub>4</sub> H <sub>9</sub>  |
| 40 ~      | CI             | Н              | CH₃                           | 2 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | C <sub>6</sub> H <sub>5</sub>       |
|           | CI             | Н              | CH <sub>3</sub>               | 2 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | (_>-cı                              |
|           | CI             | Н              | CH <sub>3</sub>               | 2 | iso-C <sub>3</sub> H <sub>7</sub> | н              | н              | (CH₂)₃CI                            |
| 45        | CI             | Н              | CH₃                           | 2 | iso-C₃H₂                          | Н              | н              | (CH₂)₄CI                            |
|           | CI             | Н              | CH <sub>3</sub>               | 2 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | CH₂CN                               |
|           | CI             | Н              | CH <sub>3</sub>               | 2 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | CH2CO2C2Hs                          |
|           | CI             | Н              | CH <sub>3</sub>               | 2 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>    |
| 50        | CI             | Н              | C₂H₅                          | 0 | н                                 | н              | Н              | CH <sub>3</sub>                     |
| 50        | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | Н                                 | н              | Н              | C <sub>2</sub> H <sub>5</sub>       |
|           | CI             | н              | C₂H₅                          | 0 | Н                                 | Н              | Н              | n-C₃H <sub>7</sub>                  |
|           |                |                |                               |   |                                   |                |                |                                     |

Table 2 (continued)

|      | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>                | n | R <sup>5</sup>  | <br>R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>                             |
|------|----------------|----------------|-------------------------------|---|-----------------|--------------------|----------------|--|
| 5    | CI .           | Н              | C₂H₅                          | 0 | Н               | н                  | Н              | iso-C₃H7                                   |
|      | CI             | н              | C₂H5                          | 0 | Н               | H                  | Н              | n-C <sub>4</sub> H <sub>9</sub>            |
|      | CI             | н              | C₂H₅                          | 0 | Н               | H                  | Н              | iso-C₄H <sub>9</sub>                       |
|      | CI             | Н              | C₂Hs                          | 0 | Н               | H                  | Н              | sec-C₄H₀                                   |
| 40   | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | н               | H                  | Н              | tert-C <sub>4</sub> H <sub>9</sub>         |
| 10   | CI             | Н              | C₂H₅                          | 0 | н               | H                  | Н              | n-CaH11                                    |
|      | CI             | Н              | C₂H₅                          | 0 | Н               | н                  | Н              | n-C <sub>6</sub> H <sub>13</sub>           |
|      | CI             | Н              | . C₂H₅                        | 0 | н               | H                  | Н              | C <sub>6</sub> H <sub>5</sub>              |
| 15   | CI             | Н              | C₂Hs                          | 0 | Н               | H ·                | Н              | — <b>(_</b> )—CI                           |
|      | CI             | Н              | C₂Hs                          | 0 | н               | н                  | н              | CI<br>———————————————————————————————————— |
| 20   | CI             | Н              | C₂H₅                          | 0 | н               | Н                  | н              | $\overline{}$                              |
|      | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 0 | н               | Н                  | н              | → CH3                                      |
| 25   | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 0 | н               | Н                  | н              | $\overline{}$                              |
|      | CI             | Н              | C₂Hs                          | 0 | н               | Н                  | н              | $\overline{}$                              |
|      | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 0 | Н               | н                  | Н              | CH=CH₂                                     |
| 30   | CI             | н              | C₂H5                          | ō | Н               | Н                  | н              | CH=CHC6Hs                                  |
|      | CI             | н              | C <sub>2</sub> H <sub>5</sub> | ō | Н               | Н                  | н              | CH2CF=CF2                                  |
|      | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 0 | Н               | Н                  | н              | (CH₂)₄Cl                                   |
|      | CI             | Н              | C₂Hs                          | 0 | н               | н                  | - H            | (CH <sub>2</sub> ) <sub>3</sub> Cl         |
| 35   | CI             | н              | C₂H₅                          | 0 | н               | н                  | Н              | CH₂CN                                      |
|      | CI             | Н              | C₂H₅                          | 0 | н               | н                  | н              | CH₂OCH₃                                    |
|      | CI             | Н              | C₂H₅                          | 0 | н               | Н                  | н              | CH2CO2C2H5                                 |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH <sub>3</sub> | H                  | н              | CH <sub>3</sub>                            |
| 40 - | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH <sub>3</sub> | н                  | Н              | CH <sub>3</sub>                            |
| -    | CI             | н              | C₂Hs                          | 0 | CH <sub>3</sub> | н                  | Н              | C₂Hs                                       |
|      | CI             | Н              | C₂H₅                          | 0 | CH₃             | Н                  | Н              | n-CaH7                                     |
|      | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH₃             | н                  | Н              | iso-C₃H <sub>7</sub>                       |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | СН₃             | н                  | Н              | n-C4H9                                     |
| 45   | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH <sub>3</sub> | н                  | Н              | iso-C₄H₃                                   |
|      | Cl             | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH <sub>3</sub> | Н                  | Н              | sec-C <sub>4</sub> H <sub>9</sub>          |
|      | Ci             | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH₃             | Н                  | н              | tert-C <sub>4</sub> H <sub>9</sub>         |
|      | CI             | Н              | C₂H₅                          | 0 | CH <sub>3</sub> | Н                  | Н              | (CH₂)₃CI                                   |
| 50   | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH <sub>3</sub> | Н                  | Н              | (CH₂)₄CI                                   |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH <sub>3</sub> | Н                  | Н              | CH₂CN                                      |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH₃             | Н                  | н              | CH2OCH3                                    |

Table 2 (continued)

| H   H   R   R   R   R   R   R   R   R  |    | <u>R</u> 1 | A <sup>2</sup> | A3                            | _ | R <sup>5</sup>                    | R <sup>6</sup> | R <sup>7</sup> | -<br>R <sup>8</sup>                |
|--|----|------------|----------------|-------------------------------|---|-----------------------------------|----------------|----------------|------------------------------------|
| Ci   | 5  |            |                |                               |   |                                   |                |                |                                    |
| CI H C2Hs 0 CHs H H CHs  CI H C2Hs 0 C3Hs H H CCHs  CI H C3Hs 0 C3Hs H H C2Hs  CI H C3Hs 0 C3Hs H H C3Hs  CI H C3Hs 0 C3Hs H H C3Hs  CI H C3Hs 0 C3Hs H H I ISO-C3Hs  CI H C3Hs 0 C3Hs H H I ISO-C3Hs  CI H C3Hs 0 C3Hs H H I ISO-C3Hs  CI H C3Hs 0 C3Hs H H I ISO-C3Hs  CI H C3Hs 0 C3Hs H H I ISO-C3Hs  CI H C3Hs 0 C3Hs H H I ISO-C3Hs  CI H C3Hs 0 C3Hs H H I ISO-C3Hs  CI H C3Hs 0 C3Hs H H I ISO-C3Hs  CI H C3Hs 0 C3Hs H H I ISO-C3Hs  CI H C3Hs 0 C3Hs H H I ISO-C3Hs  CI H C3Hs 0 C3Hs H H I ISO-C3Hs  CI H C3Hs 0 C3Hs H H I ISO-C3Hs  CI H C3Hs 0 C3Hs H H I ISO-C3Hs  CI H C3Hs 0 C3Hs H H I ISO-C3Hs  CI H C3Hs 0 C3Hs H H I ISO-C3Hs  CI H C3Hs 0 C3Hs H H I ISO-C3Hs  CI H C3Hs 0 C3Hs H H I ISO-C3Hs  CI H C3Hs 0 C3Hs H H I ISO-C3Hs  CI H C3Hs 0 N-C3Hr H H I C3Hs  CI H C3Hs 0 N-C3Hr H H I C3Hs  CI H C3Hs 0 N-C3Hr H H I C3Hs  CI H C3Hs 0 N-C3Hr H H I ISO-C3Hr  CI H C3Hs 0 N-C3Hr H I I II   |    |            |                |                               |   |                                   |                |                |                                    |
| 10   |    |            |                |                               |   |                                   |                |                | C6H5                               |
| CI H C3Hs 0 C3Hs H H H C3Hs CI H C3Hs 0 C3Hs H H H C3Hs CI H C3Hs 0 C3Hs H H H ISO-C3H7 CI H C3Hs 0 C3Hs H H ISO-C3H7 CI H C3Hs 0 C3Hs H H ISO-C3H7 CI H C3Hs 0 C3Hs H H ISO-C3H6 CI H C3Hs 0 C3Hs H H SEC-C3H6 CI H C3Hs 0 C3Hs H H SEC-C3H6 CI H C3Hs 0 C3Hs H H E1T-C3H6 CI H C3Hs 0 C3Hs H H ICH3ACI CI H C3Hs 0 C3Hs H H ICH3ACI CI H C3Hs 0 C3Hs H H CH3ACI CI H C3Hs 0 C3Hs H H CH3ACI CI H C3Hs 0 C3Hs H H CH3ACI CI H C3Hs 0 C3Hs H H CH3COC3 CI H C3Hs 0 C3Hs H H CH3COC3 CI H C3Hs 0 C3Hs H H CH3COC3 CI H C3Hs 0 C3Hs H H C4H3CI CI H C3Hs 0 C3Hs H H C4H3CI CI H C3Hs 0 C3Hs H H C4H3CI CI H C3Hs 0 C3Hs H H C3Hs  25 CI H C3Hs 0 C3Hs H H C3Hs CI H C3Hs 0 C3Hs H H C3Hs  CI H C3Hs 0 C3Hs H H C3Hs  CI H C3Hs 0 C3Hs H H C3Hs  CI H C3Hs 0 C3Hs H H C3Hs  CI H C3Hs 0 C3Hs H H C3Hs  CI H C3Hs 0 C3Hs H H C3Hs  CI H C3Hs 0 C3Hs H H C3Hs  CI H C3Hs 0 C3Hs H H C3Hs  CI H C3Hs 0 C3Hs H H C3Hs  CI H C3Hs 0 C3Hs H H C3Hs  CI H C3Hs 0 C3Hs H H C3Hs  CI H C3Hs 0 C3Hs H H C3Hs  CI H C3Hs 0 C3Hs H H C3Hs  CI H C3Hs 0 C3Hs H H C3Hs  35 CI H C3Hs 0 C3Hr H H C3Hs  CI H C3Hs 0 C3Hr H H H C3Hs  CI H C3Hs 0 C3Hr H H H C3Hs  CI H C3Hs 0 C3Hr H H H C3Hs  CI H C3Hs 0 C3Hr H H C3Hs  CI H C3Hs 0 C3C3Hr H H C3Hs  CI H C3Hs 0 C3C3Hr H H C3Hs  CI H C3Hs 0 C3C3Hr H H H C3Hs  CI H C3Hs 0 C3C3Hr H H C3Hs  CI H C3Hs 0 C3C3Hr H H H C3Hs  CI H C3Hs 0 C3C3Hr H H H C3Hs  CI H C3Hs 0 C3C3Hr H H H C3Hs  CI H C3Hs 0 C3C3Hr H H H C3Hs  CI H C3Hs 0 C3C3Hr H H H C3Hs  CI H C3Hs 0 C3C3Hr H H H C3Hs  CI H C3Hs 0 C3C3Hr H H H C3Hs   |    | Ci         | н              | C₂H₅                          | 0 | CH₃                               | Н              | Н              | ()>-cı                             |
| CI   | 10 |            |                |                               | 0 | C₂H₅                              | н              | Н              | CH₃                                |
| C  H   |    |            |                |                               | 0 | C₂H₅                              | Н              | Н              | C <sub>2</sub> H <sub>5</sub>      |
| CI   |    |            |                |                               | 0 |                                   |                | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
| 15   |    |            |                | •                             | 0 |                                   |                |                | iso-C <sub>3</sub> H <sub>7</sub>  |
| Cl   | 45 |            |                |                               | 0 |                                   |                |                |                                    |
| CI H C2Hs 0 C2Hs H H H (CH2)2CI CI H C2Hs 0 C2Hs H H H (CH2)2CI CI H C3Hs 0 C2Hs H H CCH2)2CI CI H C3Hs 0 C2Hs H H CCH2)2CI CI H C3Hs 0 C2Hs H H CCH2)CCI CI H C3Hs 0 C2Hs H H CCH2OCH CI H C3Hs 0 C2Hs H H CCH2OCH CI H C3Hs 0 C2Hs H H CCH2OCC2Hs CI H C3Hs 0 C2Hs H H CCH2OCC2Hs CI H C3Hs 0 C2Hs H H CCH3OCC2Hs CI H C3Hs 0 C2Hs H H C4H2OC3C2Hs CI H C3Hs 0 C2Hs H H C3Hs  CI H C3Hs 0 C3Hs H H H C3Hs  CI H C3Hs 0 C3Hs H H H C3C3C3Hs  CI H C3Hs 0 C3Hs H H H C3C3C3Hs  CI H C3Hs 0 C3Hs H H H C3Hs  CI H C3Hs 0 C3Hs H H H C3Hs  CI H C3Hs 0 C3Hs H H H C3Hs  CI H C3Hs 0 C3Hs H H H C3Hs  CI H C3Hs 0 C3Hs H H H C3Hs  CI H C3Hs 0 C3Hs H H H C3Hs  CI H C3Hs 0 C3Hs H H H C3Hs  CI H C3Hs 0 C3Hs H H H C3Hs  CI H C3Hs 0 C3Hs H H H C3Hs  CI H C3Hs 0 C3Hs H H H C3Hs  CI H C3Hs 0 C3Hs H H H C3Hs  CI H C3Hs 0 C3Hs H H H C3Hs  CI H C3Hs 0 C3Hs H H H C3Hs  CI H C3Hs 0 C3Hs H H H C3Hs  CI H C3Hs 0 SSO-C3Hs H H H C3Hs  CI H C3Hs 0 SSO-C3Hs H H H C3Hs  CI H C3Hs 0 SSO-C3Hs H H H C3Hs  CI H C3Hs 0 SSO-C3Hs H H H C3Hs   | 15 |            |                |                               |   |                                   |                |                | iso-C4H9                           |
| CI H C2Hs 0 C2Hs H H CCH2).CI CI H C2Hs 0 C2Hs H H CCH2).C2C2Hs CI H C2Hs 0 C2Hs H H CCCO.C2Hs CI H C2Hs 0 C2Hs H H C2Hs  CI H C2Hs 0 C2Hs H H C2Hs  CI H C2Hs 0 C2Hs H H C2Hs  CI H C2Hs 0 C2Hs H H C2Hs  CI H C2Hs 0 C2Hs H H C2Hs  CI H C2Hs 0 C2Hs H H C2Hs  CI H C2Hs 0 C2Hs H H C2Hs  CI H C2Hs 0 C2Hs H H C2Hs  CI H C2Hs 0 C2Hs H H C2Hs  CI H C2Hs 0 C2Hs H H H C2Hs  CI H C2Hs 0 C2Hs H H H C2Hs  CI H C2Hs 0 C2Hs H H H C2Hs  CI H C2Hs 0 C2Hs H H H C2Hs  CI H C2Hs 0 C2Hs H H H C2Hs  CI H C2Hs 0 C2Hs H H H C2Hs  CI H C2Hs 0 C2Hs H H H C2Hs  CI H C2Hs 0 C2Hs H H H C2Hs  CI H C2Hs 0 C2Hs H H H C2Hs  CI H C2Hs 0 C2Hs H H H C2Hs  CI H C2Hs 0 C2Hs H H H C2Hs  CI H C2Hs 0 C2Hs H H H C2Hs  CI H C2Hs 0 C2Hs H H H C2Hs  CI H C2Hs 0 C2Hs H H H C2Hs  CI H C2Hs 0 C2Hs H H H C2Hs  CI H C2Hs 0 C2Hs H H H C2Hs  CI H C2Hs 0 C2Hs H H H C2Hs  CI H C2Hs 0 C2Hs H H H C2Hs  CI H C2Hs 0 C2Hs H H H C2Hs  CI H C2Hs 0 C3C2Hs H H H C2Hs  CI H C2Hs 0 C3C2Hs H H H C2Hs  CI H C2Hs 0 C3C2Hh H H C3C3C3Hh  CI H C2Hs 0 C3CC3Hh H H C2Hs  CI H C2Hs 0 C3CC3Hh H H C3CC3C3Hh  CI H C2Hs 0 C3CC3Hh H H H C3CC3C3Hh  CI H C2Hs 0 C3CC3Hh H H C3CC3C3Hh  CI H C2Hs 0 C3CC3Hh H H C3CC3C3Hh  CI H C2Hs 0 C3CC3Hh H H H C3CC3C3Hh  CI H C2Hs 0 C3CC3Hh H H H C3CC3C3Hh  CI H C2Hs 0 C3CC3Hh H H H C3CC3C3Hh  CI H C2Hs 0 C3CC3Hh H H H C3CC3C3Hh  CI H C2Hs 0 C3CC3Hh H H H C3CC3C3Hh  CI H C2Hs 0 C3CC3Hh H H H C3CC3C3Hh  CI H C2Hs 0 C3CC3Hh H H H C3CC3C3Hh  CI H C2Hs 0 C3CC3Hh H H H C3CC3C3Hh  CI H C2Hs 0 C3CC3Hh H H H C3CC3C3Hh  CI H C2Hs 0 C3CC3Hh H H H C3CC3C3Hh  CI H C2Hs 0 C3CC3Hh H H H C3CC3C3Hh  CI H C2Hs 0 C3CC3Hh H H H C3CC3C3Hh  CI H C2Hs 0 C3CC3Hh  CI H C2Hs 0 C3CC3Hh  CI H C3Hs 0 C  |    |            |                |                               | 0 |                                   |                |                |                                    |
| 20   |    |            |                |                               | 0 |                                   |                |                | tert-C <sub>4</sub> H <sub>9</sub> |
| CI H C2Hs 0 C2Hs H H CH2CN CI H C2Hs 0 C2Hs H H CH2COC43 CI H C2Hs 0 C2Hs H H CH2CO2C2Hs CI H C2Hs 0 C2Hs H H CH3CO2C2Hs CI H C2Hs 0 C2Hs H H C4Hs  CI H C2Hs 0 C2Hs H H C4Hs  CI H C2Hs 0 C2Hs H H C3Hs  CI H C2Hs 0 C2Hs H H C2Hs  CI H C2Hs 0 C2Hs H H H C3Hs  CI H C2Hs 0 C2Hs H H H C3Hs  CI H C2Hs 0 C2Hs H H H C3Hs  CI H C2Hs 0 C3Hs H H H C3Hs  CI H C2Hs 0 C3Hs H H H C3Hs  CI H C2Hs 0 C3Hs H H H C3Hs  CI H C2Hs 0 C3Hs H H H C3Hs  CI H C2Hs 0 C3Hs H H H C3Hs  CI H C2Hs 0 C3Hs H H H C3Hs  CI H C2Hs 0 C3Hs H H H C3Hs  CI H C2Hs 0 C3Hs H H H C3Hs  CI H C2Hs 0 C3Hs H H H C3Hs  CI H C2Hs 0 C3Hs H H H C3Hs  CI H C2Hs 0 C3Hs H H H C3Hs  CI H C2Hs 0 C3Hs H H H C3Hs  CI H C2Hs 0 C3Hs H H H C3Hs  CI H C2Hs 0 C3Hs H H H C3Hs  CI H C2Hs 0 C3Hs H H H C3Hs  CI H C2Hs 0 C3Hs H H H C3Hs  CI H C2Hs 0 C3Hs H H H C3Hs  CI H C2Hs 0 C3C3Hr H H H C3Hs  CI H C2Hs 0 C3C3Hr H H H C2Hs  CI H C2Hs 0 C3C3Hr H H H C2Hs  CI H C2Hs 0 C3C3Hr H H H C2Hs  CI H C2Hs 0 C3C3Hr H H H C2Hs  CI H C2Hs 0 C3C3Hr H H H C2Hs  CI H C2Hs 0 C3C3Hr H H H C2Hs  CI H C2Hs 0 C3C3Hr H H H C2Hs  CI H C2Hs 0 C3C3Hr H H H C2Hs  CI H C2Hs 0 C3C3Hr H H H C2Hs   |    |            |                |                               | 0 |                                   |                |                |                                    |
| CI H C2Hs 0 C2Hs H H CH2OCHs CI H C2Hs 0 C2Hs H H CH2CO2C2Hs CI H C2Hs 0 C2Hs H H C4Hs CI H C2Hs 0 C2Hs H H C4Hs  CI H C2Hs 0 C2Hs H H C4Hs  CI H C2Hs 0 C2Hs H H C4Hs  CI H C2Hs 0 C2Hs H H C2Hs  CI H C2Hs 0 C2Hs H H C2Hs  CI H C2Hs 0 C2Hs H H C2Hs  CI H C2Hs 0 C2Hs H C2Hs  CI H C2Hs 0 C2Hr H C2Hs  CI H C2Hs 0 C2Hr H H C2Hs  CI H C2Hs 0 C2Hr H H H C2Hs  CI H C2Hs 0 C2Hr H H H C2Hs  CI H C2Hs 0 C2Hr H H H C2Hs  CI H C2Hs 0 C2Hr H H H C2Hs  CI H C2Hs 0 C2Hr H H H C2Hs  CI H C2Hs 0 C2Hr H H H C2Hs  CI H C2Hs 0 C2Hr H H H C2Hs  CI H C2Hs 0 C2Hr H H C2Hs  CI H C2Hs 0 C2Hr H H H C2Hs  CI H C2Hs 0 C2Hr H H H C2Hs  CI H C2Hs 0 C2Hr H H H C2Hs  CI H C2Hs 0 C2Hr H H H C2Hs  CI H C2Hs 0 C2Hr H H H C2Hs  CI H C2Hs 0 C2Hr H H H C2Hs  CI H C2Hs 0 C2Hr H H H C2Hs  CI H C2Hs 0 C3Hr H H C2Hs  CI H C2Hs 0 C3C3Hr H H C3Hs  CI H C2Hs 0 C3C3Hr H H C2Hs  CI H C2Hs 0 C3C3Hr H H C2Hs  CI H C2Hs 0 C3C3Hr H H C3Hs   | 20 |            |                |                               | 0 |                                   |                |                |                                    |
| CI H C₂Hs 0 C₂Hs H H CH₂CC₂C₂Hs CI H C₂Hs 0 C₂Hs H H C₄Hs CI H C₂Hs 0 C₂Hs H H C₂Hs CI H C₂Hs 0 C₂Hs H H H C₂Hs CI H C₂Hs 0 C₂Hs H H H C₂Hs CI H C₂Hs 0 C₂Hs H H H C₂Hs CI H C₂Hs 0 C₂Hs H H H C₂Hs CI H C₂Hs 0 C₂Hs H H H C₂Hs CI H C₂Hs 0 C₂Hs H H H C₂Hs CI H C₂Hs 0 C₂Hs H H H C₂Hs CI H C₂Hs 0 C₂Hs H H H C₂Hs CI H C₂Hs 0 C₂Hs H H H C₂Hs CI H C₂Hs 0 C₂Hs H H H C₂Hs CI H C₂Hs 0 C₂Hs H H H C∃Hs CI H C₂Hs 0 C₂Hs H H H C∃Hs CI H C₂Hs 0 C₂Hs H H H C∃Hs CI H C₂Hs 0 C₂Hs H H H C∃Hs CI H C₂Hs 0 C₂Hs H H H C∃Hs CI H C₂Hs 0 C₂Hs H H H C∃Hs CI H C₂Hs 0 C₂Hs H H H C₂Hs CI H C₂Hs 0 C₂Hs H H H C₂Hs CI H C₂Hs 0 C₂Hs H H H C₂Hs CI H C₂Hs 0 C₂Hs H H H C₂Hs CI H C₂Hs 0 C₂Hs H H H C₂Hs CI H C₂Hs 0 C₃C-C₃Hr H H C₂Hs  |    |            |                |                               | 0 | C₂H5                              |                | н              | CH₂CN                              |
| 25   |    |            |                |                               | 0 | C₂H₅                              | Н              | Н              | CH2OCH3                            |
| 25 CI H C₂Hs O C₂Hs H H CH₃ CI H C₂Hs O n-C₃Hr H H CH₃ CI H C₂Hs O n-C₃Hr H H C₂Hs CI H C₂Hs O n-C₃Hr H H C₂Hs CI H C₂Hs O n-C₃Hr H H N-C₃Hr CI H C₂Hs O n-C₃Hr H H N-C₃Hr CI H C₂Hs O n-C₃Hr H H N-C₃Hs CI H C₂Hs O n-C₃Hr H H Sec-C₃Hg CI H C₂Hs O n-C₃Hr H H Sec-C₃Hg CI H C₂Hs O n-C₃Hr H H Sec-C₃Hg CI H C₂Hs O n-C₃Hr H H C€H₂₃CI CI H C₂Hs O n-C₃Hr H H C€H₂CO CI H C₂Hs O n-C₃Hr H H C€Hs CI H C₂Hs O n-C₃Hr H H C∃Hs CI H C₂Hs O iso-C₃Hr H H C₂Hs CI H C₂Hs O iso-C₃Hr H H C₂Hs CI H C₂Hs O iso-C₃Hr H H C₂Hs CI H C₂Hs O iso-C₃Hr H H N n-C₃Hr CI H C₂Hs O iso-C₃Hr H H N n-C₃Hr CI H C₂Hs O iso-C₃Hr H H N n-C₃Hr   |    |            |                |                               | 0 | C₂H₅                              | Н              | Н              | CH2CO2C2H5                         |
| CI H C2Hs 0 C2Hs H H CH3  CI H C2Hs 0 n-C3H7 H H CH3  CI H C2Hs 0 n-C3H7 H H C3H5  CI H C2Hs 0 n-C3H7 H H N C3H5  CI H C2Hs 0 n-C3H7 H H N N-C3H7  CI H C2Hs 0 n-C3H7 H H N N-C3H8  CI H C2Hs 0 n-C3H7 H H N N-C3H8  CI H C2Hs 0 n-C3H7 H H N SEC-C4H9  CI H C2Hs 0 n-C3H7 H H N SEC-C4H9  CI H C2Hs 0 n-C3H7 H H N SEC-C4H9  CI H C2Hs 0 n-C3H7 H H N SEC-C4H9  CI H C2Hs 0 n-C3H7 H H CH2)3CI  CI H C2Hs 0 n-C3H7 H H CH2)3CI  CI H C2Hs 0 n-C3H7 H H CH2CN  CI H C2Hs 0 n-C3H7 H H CH2COC22H5  CI H C2Hs 0 n-C3H7 H H CH2COCH3  CI H C2Hs 0 n-C3H7 H H C4HS  CI H C2Hs 0 iso-C3H7 H H C3H5  CI H C2Hs 0 iso-C3H7 H H N C2H5  CI H C2Hs 0 iso-C3H7 H H N C2H5  CI H C2Hs 0 iso-C3H7 H H N C3H5  CI H C2Hs 0 iso-C3H7 H H N C3H5  CI H C2Hs 0 iso-C3H7 H H N C3H5  CI H C2Hs 0 iso-C3H7 H H N C3H5  CI H C2Hs 0 iso-C3H7 H H N C3H5  CI H C2Hs 0 iso-C3H7 H H N N-C3H9  | 05 | CI         | Н              | C₂H₅                          | 0 | C₂Hs                              | Н              | Н              | C <sub>6</sub> H <sub>5</sub>      |
| CI H C2Hs 0 n-C3H7 H H C2Hs  CI H C2Hs 0 n-C3H7 H H H n-C3H7  CI H C2Hs 0 n-C3H7 H H n-C3H7  CI H C2Hs 0 n-C3H7 H H n-C3H9  CI H C2Hs 0 n-C3H7 H H n-C4H9  CI H C2Hs 0 n-C3H7 H H siso-C4H9  CI H C2Hs 0 n-C3H7 H H sec-C4H9  CI H C2Hs 0 n-C3H7 H H sec-C4H9  CI H C2Hs 0 n-C3H7 H H cct-C4H9  CI H C2Hs 0 n-C3H7 H H (CH2)3CI  CI H C2Hs 0 n-C3H7 H H (CH2)4CI  CI H C2Hs 0 n-C3H7 H H CCt-CN  CI H C2Hs 0 n-C3H7 H H C2Hs  CI H C2Hs 0 n-C3H7 H H C2Hs  CI H C2Hs 0 iso-C3H7 H H C2Hs  CI H C2Hs 0 iso-C3H7 H H N n-C3H7  CI H C2Hs 0 iso-C3H7 H H N n-C3H7  CI H C2Hs 0 iso-C3H7 H H N n-C3H9  CI H C2Hs 0 iso-C3H7 H H N n-C3H9  CI H C2Hs 0 iso-C3H7 H H N n-C3H9  CI H C2Hs 0 iso-C3H7 H H N n-C3H9  | 25 | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | C₂H₅                              | Н              | н              | ()-cı                              |
| 30   |    |            | н              |                               | 0 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | н              | СН₃                                |
| CI H C2Hs 0 n-C3H7 H H H iso-C3H7 CI H C2Hs 0 n-C3H7 H H H iso-C3H9 CI H C2Hs 0 n-C3H7 H H H iso-C4H9 CI H C2Hs 0 n-C3H7 H H H iso-C4H9 CI H C2Hs 0 n-C3H7 H H H iso-C4H9 CI H C2Hs 0 n-C3H7 H H H tert-C4H9 CI H C2Hs 0 n-C3H7 H H H (CH2)4CI CI H C2Hs 0 n-C3H7 H H H (CH2)4CI CI H C2Hs 0 n-C3H7 H H CH2CN CI H C2Hs 0 n-C3H7 H H CH2CN CI H C2Hs 0 n-C3H7 H H CH2CN CI H C2Hs 0 n-C3H7 H H CH2CO2C2H5 CI H C2Hs 0 n-C3H7 H H CH2CO1 CI H C2Hs 0 n-C3H7 H H CH2CO1 CI H C2Hs 0 n-C3H7 H H C4H2 CI H C2Hs 0 n-C3H7 H H C4H2 CI H C2Hs 0 n-C3H7 H H C4H3 CI H C2Hs 0 iso-C3H7 H H C2H5 CI H C2Hs 0 iso-C3H7 H H C2H5 CI H C2Hs 0 iso-C3H7 H H N C2H5 CI H C2Hs 0 iso-C3H7 H H N C2H5 CI H C2Hs 0 iso-C3H7 H H N C2H5 CI H C2Hs 0 iso-C3H7 H H N n-C3H7 CI H C2Hs 0 iso-C3H7 H H N n-C4H9 CI H C2Hs 0 iso-C3H7 H H N n-C4H9 CI H C2Hs 0 iso-C3H7 H H N n-C4H9 CI H C2Hs 0 iso-C3H7 H H N n-C4H9  |    |            |                |                               | 0 |                                   | Н              | Н              | C₂H₅                               |
| CI H C₂Hs 0 n-C₃H7 H H H iso-C₄H9  CI H C₂Hs 0 n-C₃H7 H H Sec-C₄H9  CI H C₂Hs 0 n-C₃H7 H H (CH₂)₃CI  CI H C₂Hs 0 n-C₃H7 H H (CH₂)₃CI  CI H C₂Hs 0 n-C₃H7 H H CH₂CN  CI H C₂Hs 0 n-C₃H7 H H CH₂CN  CI H C₂Hs 0 n-C₃H7 H H CH₂CO₂C₂Hs  CI H C₂Hs 0 n-C₃H7 H H CH₂CO₁C  CI H C₂Hs 0 n-C₃H7 H H CH₂CO₁C  CI H C₂Hs 0 n-C₃H7 H H C₂Hs  CI H C₂Hs 0 n-C₃H7 H H C₂Hs  CI H C₂Hs 0 n-C₃H7 H H C₂Hs  CI H C₂Hs 0 iso-C₃H7 H H N-C₃H7  CI H C₂Hs 0 iso-C₃H7 H H N-C₃H9  CI H C₂Hs 0 iso-C₃H7 H H N-C₃H9  | 30 |            |                |                               | 0 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
| CI H C₂Hs 0 n-C₃H7 H H Sec-C₄H9  CI H C₂Hs 0 n-C₃H7 H H Sec-C₄H9  CI H C₂Hs 0 n-C₃H7 H H H tert-C₄H9  CI H C₂Hs 0 n-C₃H7 H H (CH₂)₃CI  CI H C₂Hs 0 n-C₃H7 H H (CH₂)₃CI  CI H C₂Hs 0 n-C₃H7 H H CH₂CN  CI H C₂Hs 0 n-C₃H7 H H CH₂CN  CI H C₂Hs 0 n-C₃H7 H H CH₂CO₂C₂Hs  CI H C₂Hs 0 n-C₃H7 H H CH₂COH3  CI H C₂Hs 0 n-C₃H7 H H CH₂COH3  CI H C₂Hs 0 n-C₃H7 H H C₄Hs  CI H C₂Hs 0 n-C₃H7 H H C₄Hs  CI H C₂Hs 0 n-C₃H7 H H C₄Hs  CI H C₂Hs 0 iso-C₃H7 H H C₂Hs  CI H C₂Hs 0 iso-C₃H7 H H N-C₃H7  CI H C₂Hs 0 iso-C₃H7 H H N-C₃H9  CI H C₂Hs 0 iso-C₃H7 H H N-C₃H9   |    |            | Н              | C₂Hs                          | 0 | n-C <sub>3</sub> H <sub>7</sub>   | н              | н              | iso-CsH7                           |
| CI H C₂Hs 0 n-C₃H7 H H H Sec-C₄H9  CI H C₂Hs 0 n-C₃H7 H H H (CH₂)₃CI  CI H C₂Hs 0 n-C₃H7 H H (CH₂)₃CI  CI H C₂Hs 0 n-C₃H7 H H (CH₂)₄CI  CI H C₂Hs 0 n-C₃H7 H H CH₂CN  CI H C₂Hs 0 n-C₃H7 H H CH₂CN  CI H C₂Hs 0 n-C₃H7 H H CH₂CO₂C₂Hs  CI H C₂Hs 0 n-C₃H7 H H CH₂CO+C₂Hs  CI H C₂Hs 0 n-C₃H7 H H CH₂CO+C₂Hs  CI H C₂Hs 0 n-C₃H7 H H C-c⋅C  CI H C₂Hs 0 n-C₃H7 H H C-c⋅C  CI H C₂Hs 0 n-C₃H7 H H C-c⋅C  CI H C₂Hs 0 iso-C₃H7 H H C-c⋅C  CI H C₂Hs 0 iso-C₃H7 H H C₂Hs  CI H C₂Hs 0 iso-C₃H7 H H C₂Hs  CI H C₂Hs 0 iso-C₃H7 H H N-C₃H7  CI H C₂Hs 0 iso-C₃H7 H H N-C₃H5  CI H C₂Hs 0 iso-C₃H7 H H N-C₃H5  CI H C₂Hs 0 iso-C₃H7 H H N-C₃H5  CI H C₂Hs 0 iso-C₃H7 H H N-C₃H9  CI H C₂Hs 0 iso-C₃H7 H H N-C₃H9  CI H C₂Hs 0 iso-C₃H7 H H N-C₃H9   |    |            | Н              | C₂H <sub>5</sub>              | 0 | n-C <sub>3</sub> H <sub>7</sub>   | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>    |
| CI H C₂Hs 0 n-C₃H7 H H (CH₂)₃CI CI H C₂Hs 0 n-C₃H7 H H (CH₂)₃CI CI H C₂Hs 0 n-C₃H7 H H (CH₂)₃CI CI H C₂Hs 0 n-C₃H7 H H CH₂CN CI H C₂Hs 0 n-C₃H7 H H CH₂CN CI H C₂Hs 0 n-C₃H7 H H CH₂CO₂C₂Hs CI H C₂Hs 0 n-C₃H7 H H CH₂CO₂C₂Hs CI H C₂Hs 0 n-C₃H7 H H C₂CO⊆C₂Hs CI H C₂Hs 0 iso-C₃H7 H H C₂CO⊆C₂Hs CI H C₂Hs 0 iso-C₃H7 H H C₂CO⊆C₃H5 CI H C₂Hs 0 iso-C₃H7 H H C₂CO⊆C₃H5 CI H C₂CO⊆C₃H7 H H C₂CO⊆C₃H7 CI H C₂CO⊆C₃H7 H H N n-C₃CO⊆C₃H7 CI H C₂CO⊆C₃H5 CI H C₂CO⊆C₃H7 H H N n-C₃CO⊆C₃H7  |    |            | Н              | C₂Hs                          | 0 | n-C <sub>3</sub> H <sub>7</sub>   | н              | Н              | iso-C4H9                           |
| CI H C2Hs 0 n-C3H7 H H (CH2)aCl  CI H C2Hs 0 n-C3H7 H H (CH2)aCl  CI H C2Hs 0 n-C3H7 H H (CH2)aCl  CI H C2Hs 0 n-C3H7 H H CH2CN  CI H C2Hs 0 n-C3H7 H H CH2CO2C2Hs  CI H C2Hs 0 n-C3H7 H H CH2CO2C2Hs  CI H C2Hs 0 n-C3H7 H H CH2CO2C3H5  CI H C2Hs 0 n-C3H7 H H C42OCH3  CI H C2Hs 0 n-C3H7 H H C4HS  CI H C2Hs 0 n-C3H7 H H C4HS  CI H C2Hs 0 iso-C3H7 H H C2Hs  CI H C2Hs 0 iso-C3H7 H H C2Hs  CI H C2Hs 0 iso-C3H7 H H C2Hs  CI H C2Hs 0 iso-C3H7 H H n-C3H7   |    |            |                | C <sub>2</sub> H <sub>5</sub> | 0 | n-CaH7                            | н -            | н              | sec-C <sub>4</sub> H <sub>9</sub>  |
| CI H C <sub>2</sub> H <sub>5</sub> 0 n-C <sub>3</sub> H <sub>7</sub> H H CH <sub>2</sub> CN  CI H C <sub>2</sub> H <sub>5</sub> 0 n-C <sub>3</sub> H <sub>7</sub> H H CH <sub>2</sub> CN  CI H C <sub>2</sub> H <sub>5</sub> 0 n-C <sub>3</sub> H <sub>7</sub> H H CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 n-C <sub>3</sub> H <sub>7</sub> H H CH <sub>2</sub> COCH <sub>3</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 n-C <sub>3</sub> H <sub>7</sub> H H C <sub>4</sub> H <sub>5</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 n-C <sub>3</sub> H <sub>7</sub> H H C <sub>4</sub> H <sub>5</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H C <sub>4</sub> H <sub>5</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H C <sub>4</sub> H <sub>5</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H C <sub>2</sub> H <sub>5</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>3</sub> H <sub>7</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>3</sub> H <sub>7</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>3</sub> H <sub>7</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>4</sub> H <sub>9</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>4</sub> H <sub>9</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>4</sub> H <sub>9</sub>   | 35 |            |                |                               | 0 | n-C <sub>3</sub> H <sub>7</sub>   | н              | н              | tert-C <sub>4</sub> H <sub>9</sub> |
| CI H C <sub>2</sub> H <sub>5</sub> 0 n-C <sub>3</sub> H <sub>7</sub> H H CH <sub>2</sub> CN  CI H C <sub>2</sub> H <sub>5</sub> 0 n-C <sub>3</sub> H <sub>7</sub> H H CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 n-C <sub>3</sub> H <sub>7</sub> H H CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 n-C <sub>3</sub> H <sub>7</sub> H H C <sub>4</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 n-C <sub>3</sub> H <sub>7</sub> H H C <sub>4</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 n-C <sub>3</sub> H <sub>7</sub> H H C <sub>4</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H C <sub>4</sub> CO <sub>2</sub> CO <sub>3</sub>   |    |            |                | C₂Hs                          | 0 | n-C <sub>3</sub> H <sub>7</sub>   | н              | н              | (CH <sub>2</sub> ) <sub>3</sub> CI |
| CI H C <sub>2</sub> H <sub>S</sub> 0 n-C <sub>3</sub> H <sub>7</sub> H H CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>S</sub> CI H C <sub>2</sub> H <sub>S</sub> 0 n-C <sub>3</sub> H <sub>7</sub> H H CH <sub>2</sub> OCH <sub>3</sub> CI H C <sub>2</sub> H <sub>S</sub> 0 n-C <sub>3</sub> H <sub>7</sub> H H C <sub>6</sub> H <sub>S</sub> CI H C <sub>2</sub> H <sub>S</sub> 0 n-C <sub>3</sub> H <sub>7</sub> H H C <sub>6</sub> H <sub>S</sub> CI H C <sub>2</sub> H <sub>S</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H CH <sub>3</sub> CI H C <sub>2</sub> H <sub>S</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H C <sub>2</sub> H <sub>S</sub> CI H C <sub>2</sub> H <sub>S</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H C <sub>2</sub> H <sub>S</sub> CI H C <sub>2</sub> H <sub>S</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>3</sub> H <sub>7</sub> CI H C <sub>2</sub> H <sub>S</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>3</sub> H <sub>7</sub> CI H C <sub>2</sub> H <sub>S</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>3</sub> H <sub>7</sub> CI H C <sub>2</sub> H <sub>S</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>4</sub> H <sub>9</sub> CI H C <sub>2</sub> H <sub>S</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H iso-C <sub>4</sub> H <sub>9</sub>   |    |            | Н              | C₂H₅                          | 0 | n-CaH7                            | н              | Н              | (CH₂)₄CI                           |
| CI H C <sub>2</sub> H <sub>5</sub> 0 n-C <sub>3</sub> H <sub>7</sub> H H CH <sub>2</sub> OCH <sub>3</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 n-C <sub>3</sub> H <sub>7</sub> H H C <sub>6</sub> H <sub>5</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 n-C <sub>3</sub> H <sub>7</sub> H H C <sub>6</sub> H <sub>5</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H C <sub>2</sub> H <sub>5</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H C <sub>2</sub> H <sub>5</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H C <sub>2</sub> H <sub>5</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>3</sub> H <sub>7</sub> CI H C <sub>2</sub> H <sub>6</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>3</sub> H <sub>7</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>4</sub> H <sub>9</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>4</sub> H <sub>9</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>4</sub> H <sub>9</sub>  |    |            | Н              | C₂H <sub>5</sub>              | 0 | n-C <sub>3</sub> H <sub>7</sub>   | н              | Н              | CH₂CN                              |
| CI H C <sub>2</sub> H <sub>5</sub> 0 n-C <sub>3</sub> H <sub>7</sub> H H C <sub>6</sub> H <sub>5</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 n-C <sub>3</sub> H <sub>7</sub> H H C <sub>4</sub> CI  CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H C <sub>4</sub> C <sub>4</sub> CI  CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H C <sub>2</sub> H <sub>5</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>3</sub> H <sub>7</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>3</sub> H <sub>7</sub> CI H C <sub>4</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>4</sub> H <sub>9</sub> CI H C <sub>4</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>4</sub> H <sub>9</sub> CI H C <sub>4</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H iso-C <sub>4</sub> H <sub>9</sub>  | 40 |            |                |                               | 0 |                                   | Н              | Н              | CH2CO2C2H5                         |
| CI H C <sub>2</sub> H <sub>5</sub> 0 n-C <sub>2</sub> H <sub>7</sub> H H CH <sub>3</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H CH <sub>3</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H C <sub>2</sub> H <sub>5</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>3</sub> H <sub>7</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>3</sub> H <sub>7</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>4</sub> H <sub>9</sub> 50 CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>4</sub> H <sub>9</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H iso-C <sub>4</sub> H <sub>9</sub>   |    |            |                | C <sub>2</sub> H <sub>5</sub> | 0 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | CH <sub>2</sub> OCH₃               |
| CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H CH <sub>3</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H C <sub>2</sub> H <sub>5</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>3</sub> H <sub>7</sub> CI H C <sub>2</sub> H <sub>6</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H iso-C <sub>3</sub> H <sub>7</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>4</sub> H <sub>9</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H iso-C <sub>4</sub> H <sub>9</sub>  |    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | C <sub>6</sub> H <sub>5</sub>      |
| CI H C2Hs 0 iso-C3H7 H H CH3  CI H C2Hs 0 iso-C3H7 H H C2Hs  CI H C2Hs 0 iso-C3H7 H H n-C3H7  CI H C2Hs 0 iso-C3H7 H H iso-C3H7  CI H C2Hs 0 iso-C3H7 H H n-C4H9  CI H C2Hs 0 iso-C3H7 H H iso-C4H9  |    | CI         | Н              | C₂H₅                          | 0 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | н              | ()-cı                              |
| CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>2</sub> H <sub>7</sub> H H n-C <sub>3</sub> H <sub>7</sub> CI H C <sub>2</sub> H <sub>6</sub> 0 iso-C <sub>2</sub> H <sub>7</sub> H H iso-C <sub>3</sub> H <sub>7</sub> 50 CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>4</sub> H <sub>9</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H iso-C <sub>4</sub> H <sub>9</sub>   | 45 |            | н              | C <sub>2</sub> H <sub>5</sub> | 0 | iso-C₃H₁                          | Н              | Н              | CH <sub>3</sub>                    |
| CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>3</sub> H <sub>7</sub> CI H C <sub>2</sub> H <sub>6</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H iso-C <sub>3</sub> H <sub>7</sub> 50 CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>4</sub> H <sub>9</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H iso-C <sub>4</sub> H <sub>9</sub>   |    |            | Н              | C₂H <sub>5</sub>              | 0 | iso-C₃H <sub>7</sub>              | Н              |                |                                    |
| CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H iso-C <sub>3</sub> H <sub>7</sub> 50 CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>4</sub> H <sub>9</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H iso-C <sub>4</sub> H <sub>9</sub>  |    | CI         | Н              | C₂H₅                          | 0 | iso-C <sub>3</sub> H <sub>7</sub> | Н              |                |                                    |
| 50 CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H n-C <sub>4</sub> H <sub>9</sub> CI H C <sub>2</sub> H <sub>5</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H iso-C <sub>4</sub> H <sub>9</sub>   |    | CI         | Н              | C₂H₅                          | 0 | iso-C <sub>3</sub> H <sub>7</sub> | н              |                |                                    |
| CI H C <sub>2</sub> H <sub>s</sub> 0 iso-C <sub>3</sub> H <sub>7</sub> H H iso-C <sub>4</sub> H <sub>9</sub>   | 50 | CI         | н              | C₂H₅                          | 0 | iso-C <sub>3</sub> H <sub>7</sub> | Н              |                |                                    |
| At the same of the |    | CI         | Н              | C₂Hs                          | 0 |                                   | н              |                |                                    |
|  |    | CI         | Н              | C₂H <sub>5</sub>              | 0 | iso-C <sub>3</sub> H <sub>7</sub> | н              |                | sec-C <sub>4</sub> H <sub>9</sub>  |

Table 2 (continued)

|    | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>                | n | R <sup>5</sup>                     | R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>                     |
|----|----------------|----------------|-------------------------------|---|------------------------------------|----------------|----------------|------------------------------------|
| 5  |                | Н.             | C₂H₅                          | 0 | CH <sub>3</sub>                    | Н              | Н              | CH₂CN                              |
|    | CI             | H              | C₂H₅                          | 0 | CH₃                                | н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>   |
|    | CI             | Н              | C₂H <sub>5</sub>              | 0 | iso-C <sub>3</sub> H <sub>7</sub>  | н              | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
|    | CI             | н              | C₂H₅                          | 0 | iso-C₃H7                           | н              | н              | (CH₂)₃CI                           |
| 10 | CI             | Н              | C₂H₅                          | 0 | iso-C <sub>2</sub> H <sub>7</sub>  | Н              | Н              | (CH₂)₄CI                           |
|    | CI             | Н              | C₂Hs                          | 0 | iso-C₃H <sub>7</sub>               | н              | н              | CH₂CN                              |
|    | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub>  | н              | н              | CH2OCH3                            |
|    | CI             | Н              | C₂Hs                          | 0 | iso-C <sub>3</sub> H <sub>7</sub>  | Н              | н              | CH2CO2C2H5                         |
| 15 | CI             | Н              | C₂Hs                          | 0 | iso-C <sub>2</sub> H <sub>7</sub>  | н              | Н              | CeHs                               |
| 15 | CI             | Н              | C₂Hs                          | 0 | iso-C <sub>3</sub> H <sub>7</sub>  | н              | Н              | <b>⟨_</b> >-cı                     |
|    | ÇI             | Н              | C₂H₅                          | 0 | CH₂OCH₃                            | Н              | н              | СН₃                                |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH₂SCH₃                            | Н              | Н              | CH <sub>3</sub>                    |
| 20 | CI             | Н              | C₂Hs                          | 0 | COC₂H <sub>5</sub>                 | Н              | Н              | CH <sub>3</sub>                    |
|    | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 0 | COC₂H <sub>5</sub>                 | н              | н              | C₂Hs                               |
|    | CI             | н              | C₂H₅                          | 0 | COC <sub>3</sub> H <sub>7</sub> -n | Н              | н              | CH <sub>3</sub>                    |
|    | CI             | Н              | C₂H₅                          | 1 | Н                                  | Н              | Н              | CH <sub>3</sub>                    |
| 25 | CI             | Н              | C2H5                          | 1 | Н                                  | Н              | Н              | C₂H <sub>5</sub>                   |
| 25 | CI             | н              | C₂Hs                          | 1 | Н                                  | Н              | н              | n-C <sub>3</sub> H <sub>7</sub>    |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | Н                                  | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>  |
|    | CI             | Н              | C₂Hs                          | 1 | Н                                  | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>    |
|    | CI             | Н              | C2Hs                          | 1 | Н                                  | H              | Н              | iso-C4H9                           |
| 30 | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | Н                                  | н              | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
|    | CI             | Н              | C₂Hs                          | 1 | Н                                  | Н              | Н              | (CH₂)₃Cl                           |
|    | CI             | Н              | C₂H₅                          | 1 | н                                  | Н              | Н              | CH₂CN                              |
|    | CI             | Н              | C₂H₅                          | 1 | Н                                  | Н              | Н              | CH₂OCH₃                            |
| 35 | CI             | Н              | C₂H <sub>5</sub>              | 1 | н                                  | Н              | H              |                                    |
|    | CI             | Н              | C₂H₅                          | 1 | Н                                  | Н              | Н              | $\overline{}$                      |
|    | CI             | н              | C₂H₅                          | 1 | н                                  | н              | н              | -CH₃                               |
| 40 | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | н                                  | Н              | н              | CeHs                               |
|    | CI             | Н              | C₂H₅                          | 1 | Н                                  | Н              | Н              | ()-cı                              |
|    | CI             | Н              | C₂Hs                          | 1 | CH₃                                | н              | Н              | CH <sub>3</sub>                    |
| 45 | CI             | Н              | C2H5                          | 1 | CH₃                                | н              | н              | C <sub>2</sub> Hs                  |
|    | CI             | Н              | C₂Hs                          | 1 | CH <sub>3</sub>                    | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
|    | CI             | Н              | C₂Hs                          | 1 | CH₃                                | Н              | н              | iso-C <sub>3</sub> H <sub>7</sub>  |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | CH <sub>3</sub>                    | н              | H              | n-CaHe                             |
| 50 | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | CH <sub>3</sub>                    | H              | н              | iso-C <sub>4</sub> H <sub>9</sub>  |
|    | CI             | Н              | C2Hs                          | 1 | CHs                                | н              | н              | sec-C <sub>4</sub> H <sub>9</sub>  |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | CH₃                                | н              | н              | tert-C <sub>4</sub> H <sub>9</sub> |

Table 2 (continued)

|      | R <sup>1</sup> | R <sup>2</sup> | <sub>R</sub> 3                | n | R <sup>5</sup>                    | <sub>R</sub> 6 | R <sup>7</sup> | 8                                  |
|------|----------------|----------------|-------------------------------|---|-----------------------------------|----------------|----------------|------------------------------------|
| 5    | CI.            | Н              | C₂Hs                          | 1 | CH <sub>3</sub>                   | H              | Н              | (CH₂)₃CI                           |
|      | CI             | Н              | C₂Hs                          | 1 | CH <sub>3</sub>                   | Н              | Н              | (CH₂)₄CI                           |
|      | CI             | Н              | C₂H₅                          | 1 | CH <sub>3</sub>                   | Н              | Н              | CH₂CN                              |
|      | Cl             | Н              | C₂H₅                          | 1 | CH₃                               | Н              | Н              | CH2CO2C2Hs                         |
| 10   | CI             | Н              | C₂H₅                          | 1 | CH₃                               | Н              | Н              | CH2OCH3                            |
|      | CI             | Н              | C₂H₅                          | 1 | CH₃                               | Н              | Н              | C <sub>6</sub> H <sub>5</sub>      |
|      | CI             | Н              | C₂H₅                          | 1 | CH <sub>3</sub>                   | Н              | Н              | - <b>C</b> I                       |
| -    | Cl             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | C₂Hs                              | Н              | н              | CHs                                |
| 15   | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | C <sub>2</sub> H <sub>5</sub>     | Н              | Н              | C <sub>2</sub> H <sub>5</sub>      |
|      | CI             | Н              | C₂H₅                          | 1 | C <sub>2</sub> H <sub>5</sub>     | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | C <sub>2</sub> H <sub>5</sub>     | Н              | н              | iso-C₃H <sub>7</sub>               |
|      | CI             | Н              | C₂H₅                          | 1 | C₂Hs                              | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>    |
| 20   | CI             | Н              | C₂H₅                          | 1 | C <sub>2</sub> H <sub>5</sub>     | Н              | Н              | iso-C₄H₀                           |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | C₂Hs                              | н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>  |
|      | CI             | Н              | C₂H₅                          | 1 | CzHs                              | H              | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
|      | CI             | Н              | C₂H₅                          | 1 | C <sub>2</sub> H <sub>5</sub>     | Н              | Н              | (CH <sub>2</sub> ) <sub>3</sub> CI |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | C <sub>2</sub> Hs                 | Н              | Н              | (CH₂)₄CI                           |
| 25   | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | C <sub>2</sub> H <sub>5</sub>     | Н              | н              | CH₂CN                              |
|      | CI             | Н              | C₂H₅                          | 1 | C <sub>2</sub> H <sub>5</sub>     | Н              | Н              | CH2OCH3                            |
|      | CI             | H              | C⁵Ĥs                          | 1 | C <sub>2</sub> H <sub>5</sub>     | Н              | Н              | CH2CO2C2H5                         |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | C₂H₅                              | Н              | Н              | CeHs                               |
| 30   | CI             | Н              | C₃H₅                          | 1 | C <sub>2</sub> H <sub>5</sub>     | Н              | Н              | CI                                 |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | n-CaH7                            | Н              | Н              | CH <sub>3</sub>                    |
|      | CI             | Н              | C2H5                          | 1 | n-CaH7                            | Н              | н              | C2Hs                               |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | n-C <sub>3</sub> H <sub>7</sub>   | н -            | н              | n-CaH7                             |
| 35   | CI             | Н              | C₂H₅                          | 1 | n-CaH <sub>7</sub>                | Н              | н              | iso-C <sub>3</sub> H <sub>7</sub>  |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | п-СаН7                            | Н              | Н              | n-C-He                             |
|      | CI             | Н              | C₂H₅                          | 1 | n-CaH7                            | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>  |
|      | CI             | Н              | C₂Hs                          | 1 | n-CaH <sub>7</sub>                | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>  |
| 40 _ | CI             | Н              | C₂H₅                          | 1 | n-CaHz                            | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
|      | CI             | Н              | C₂Hs                          | 1 | n-C₃H₂                            | н              | Н              | (CH2)3CI                           |
|      | CI             | Н              | C₂H₅                          | 1 | n-CaH7                            | Н              | Н              | (CH₂)₄CI                           |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | CH₂CN                              |
| 45   | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | CH2CO2C2H5                         |
| 45   | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>   |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | C <sub>6</sub> H <sub>5</sub>      |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | н              |                                    |
| 50   | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub> | н              | н              | CH₃                                |
|      | CI             | н              | C₂Hs                          | 1 | iso-C₃H <sub>7</sub>              | Н              | Н              | C₂Hs                               |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
|      |                |                |                               |   |                                   |                |                |                                    |

Table 2 (continued)

|      | <u>R</u> 1 | я <sup>2</sup> | R <sup>3</sup>                | n | R <sup>5</sup>                    | ค <sup>6</sup> | _ R <sup>7</sup> | R <sup>8</sup>                     |
|------|------------|----------------|-------------------------------|---|-----------------------------------|----------------|------------------|------------------------------------|
| 5    | CI         | Н              | C₂H₅                          | 1 | iso-CaH7                          | Н              | Н                | iso-C <sub>3</sub> H <sub>7</sub>  |
|      | CI         | Н              | G₂Hs                          | 1 | iso-C₃H₁                          | Н              | н                | n-C <sub>4</sub> H <sub>9</sub>    |
|      | CI         | Н              | C₂H₅                          | 1 | iso-C <sub>2</sub> H <sub>7</sub> | Н              | Н                | iso-C <sub>4</sub> H <sub>9</sub>  |
|      | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н                | sec-C <sub>4</sub> H <sub>9</sub>  |
| 10   | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н                | tert-C₄H₂                          |
| 70   | CI         | Н              | C₂H₅                          | 1 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н                | (CH₂)₃CI                           |
|      | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н                | (CH₂)₄CI                           |
|      | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н                | CH₂CN                              |
| •    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н                | CH <sub>2</sub> OCH <sub>3</sub>   |
| 15   | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н                | CH2CO2C2Hs                         |
|      | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н                | C <sub>6</sub> H <sub>5</sub>      |
|      | CI         | Н              | C₂Hs                          | 1 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н                | <_>-cı                             |
| 00   | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | Н                                 | Н              | н                | CH₃                                |
| 20   | CI         | Н              | C₂Hs                          | 2 | Н                                 | н              | н                | C₂H₅                               |
|      | CI         | Н              | C₂H₅                          | 2 | н                                 | Н              | Н                | n-C <sub>3</sub> H <sub>7</sub>    |
|      | CI         | Н              | C₂H₅                          | 2 | Н                                 | Н              | Н                | iso-C <sub>3</sub> H <sub>7</sub>  |
|      | CI         | Н              | C₂H₅                          | 2 | Н                                 | Н              | Н                | n-C <sub>4</sub> H <sub>9</sub>    |
| 25   | CI         | Н              | C₂H₅                          | 2 | Н                                 | Н              | н                | iso-C₄H₃                           |
|      | CI         | Н              | C₂Hs                          | 2 | Н                                 | н              | H                | tert-C <sub>4</sub> H <sub>9</sub> |
|      | CI         | Н              | C₂H₅                          | 2 | Н                                 | Н              | н                | (CH₂)₃CI                           |
|      | CI         | Н              | C₂H₅                          | 2 | Н                                 | Н              | Н                | CH₂CN                              |
| 30   | CI         | Н              | C₂Hs                          | 2 | Н                                 | Н              | н                | CH₂OCH₃                            |
|      | CI         | Н              | C₂H₅                          | 2 | H                                 | Н              | Н                | CH2CO2C2H5                         |
|      | CI         | Н              | C₂Hs                          | 2 | Н                                 | Н              | Н                | $\overline{}$                      |
| 35   | CI         | н              | C₂H₅                          | 2 | Н                                 | Н              | - H              | ĊH,                                |
|      | CI         | Н              | C₂H₅                          | 2 | Н                                 | Н              | Н                | C <sub>6</sub> H <sub>5</sub>      |
|      | CI         | Н              | C₂Hs                          | 2 | н                                 | Н              | н                |                                    |
| 40 ~ | CI         | Н              | C₂H₅                          | 2 | CH <sub>3</sub>                   | Н              | н                | CH <sub>3</sub>                    |
|      | CI         | Н              | C₂H₅                          | 2 | CH <sub>3</sub>                   | Н              | н                | C <sub>2</sub> H <sub>5</sub>      |
|      | CI         | Н              | C₂H₅                          | 2 | CH <sub>3</sub>                   | Н              | Н                | n-C₃H₂                             |
|      | CI         | Н              | C₂H₅                          | 2 | CH <sub>3</sub>                   | Н              | Н                | iso-C₃H7                           |
| 45   | CI         | Н              | C₂H₅                          | 2 | CH <sub>3</sub>                   | Н              | Н                | n-C <sub>4</sub> H <sub>9</sub>    |
|      | CI         | Н              | C₂H₅                          | 2 | CH <sub>3</sub>                   | Н              | Н                | iso-C <sub>4</sub> H <sub>9</sub>  |
|      | CI         | Н              | C₂H <sub>5</sub>              | 2 | CH₃                               | Н              | н                | sec-C <sub>4</sub> H <sub>9</sub>  |
|      | CI         | Н              | C₂H₅                          | 2 | CH <sub>3</sub>                   | Н              | Н                | tert-C <sub>4</sub> H <sub>9</sub> |
|      | CI         | Н              | C₂H <sub>5</sub>              | 2 | CH <sub>3</sub>                   | н              | Н                | (CH₂)₃CI                           |
| 50   | CI         | Н              | C₂Hs                          | 2 | CH <sub>3</sub>                   | Н              | Н                | (CH₂)₄CI                           |
|      | CI         | Н              | C₂H₅                          | 2 | CH₃                               | Н              | Н                | CH₂CN                              |

Table 2 (continued)

|      | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>                | n | R <sup>5</sup>                    | В <sup>6</sup> | в <sup>7</sup> |                                    |
|------|----------------|----------------|-------------------------------|---|-----------------------------------|----------------|----------------|------------------------------------|
| 5    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | CH₃                               | Н              | Н              | CH2CO2C2H5                         |
|      | CI             | Н              | C₂H₅                          | 2 | CH₃                               | Н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>   |
|      | CI             | Н              | C₂H₅                          | 2 | CH <sub>3</sub>                   | Н              | Н              | C <sub>6</sub> H <sub>5</sub>      |
|      | CI             | Н              | C₂H₅                          | 2 | CH₃                               | Н              | Н              | ()-cı                              |
| 10   | CI             | н              | C₂H₅                          | 2 | C₂H₅                              | Н              | н              | CH₃                                |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | C <sub>2</sub> H <sub>5</sub>     | н              | Н              | C₂H₅                               |
|      | CI             | Н              | C₂H5                          | 2 | C₂H₅                              | H              | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
| •    | CI             | Н              | C₂H₅                          | 2 | C <sub>2</sub> H <sub>5</sub>     | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>  |
| 15   | CI             | Н              | C₂H₅                          | 2 | C <sub>2</sub> H <sub>5</sub>     | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>    |
|      | CI             | Н              | C₂H₅                          | 2 | C₂H5                              | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>  |
|      | CI             | Н              | C₂H₅                          | 2 | C <sub>2</sub> H <sub>5</sub>     | Н              | Н              | sec-C₄H₀                           |
| =    | CI             | Н              | C₂H <sub>5</sub>              | 2 | C₂Hs                              | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
| 20   | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | C₂Hs                              | Н              | Н              | (CH₂)₃CI                           |
|      | CI             | Н              | C₂H₅                          | 2 | C₂H₅                              | Н              | Н              | (CH₂)₄CI                           |
|      | Cl             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | C₂H₅                              | н              | Н              | CH₂CN                              |
|      | CI             | Н              | C₂H₅                          | 2 | C₂H₅                              | н              | н              | CH2CO2C2H5                         |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | C₂H₅                              | Н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>   |
| 25   | CI             | Н              | C₂H₅                          | 2 | C₂Hs                              | Н              | Н              | C <sub>6</sub> H <sub>5</sub>      |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | C <sub>2</sub> H <sub>5</sub>     | Н              | н              | ()-cı                              |
|      | CI             | Н              | C₂H₅                          | 2 | n-C <sub>3</sub> H <sub>7</sub>   | н              | Н              | CH <sub>3</sub>                    |
| 30   | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | C₂Hs                               |
|      | CI             | Н              | C₂H <sub>5</sub>              | 2 | n-C <sub>3</sub> H <sub>7</sub>   | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>  |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>    |
| 35   | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | n-C <sub>3</sub> H <sub>7</sub>   | H +            | Н              | iso-C <sub>4</sub> H <sub>9</sub>  |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>  |
|      | CI             | Н              | C₂H₅                          | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | (CH₂)₃CI                           |
|      | CI             | Н              | C₂Hs                          | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | (CH₂)₄CI                           |
| 40 ~ | CI             | Ή              | C₂H <sub>5</sub>              | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | CH₂CN                              |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | CH2CO2C2H5                         |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | CH₂OCH₃                            |
|      | CI             | Н              | C₂H₅                          | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | C <sub>6</sub> H <sub>5</sub>      |
| 45   | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | n-C₃H₁                            | н              | Н              |                                    |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | iso-C <sub>3</sub> H <sub>7</sub> | н              | H              | CH <sub>3</sub>                    |
|      | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 2 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | C₂Hs                               |
|      | CI             | н              | C₂Hs                          | 2 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
| 50   | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 2 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>  |
|      | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>    |
|      | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 2 | iso-C <sub>2</sub> H <sub>7</sub> | Н              | н              | iso-C <sub>4</sub> H <sub>9</sub>  |

Table 2 (continued)

| _  | <u>R</u> 1 | R <sup>2</sup> | R <sup>3</sup>                  | n | R <sup>5</sup>                    | R <sup>6</sup> | я <sup>7</sup> | R <sup>8</sup>  |
|----|------------|----------------|---------------------------------|---|-----------------------------------|----------------|----------------|---|
| 5  | CI         | Н              | C <sub>2</sub> H <sub>5</sub>   | 2 | iso-C₃H <sub>7</sub>              | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
|    | CI         | Н              | C₂H₅                            | 2 | iso-C₃H₁                          | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | CI         | Н              | C₂H₅                            | 2 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | (CH₂)₃CI  |
|    | CI         | Н              | C₂H₅                            | 2 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | (CH₂)₄CI  |
| 10 | CI         | Н              | C₂H₅                            | 2 | iso-C₃H7                          | H              | н              | CH₂CN   |
|    | CI         | Н              | C₂H₅                            | 2 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | CH2CO2C2H5  |
|    | CI         | Н              | C₂H₅                            | 2 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | н              | CH₂OCH₃   |
| -  | CI         | Н              | C₂H₅                            | 2 | iso-C₃H7                          | Н              | н              | C <sub>6</sub> H <sub>5</sub>                                 |
| 15 | CI         | Н              | C <sub>2</sub> H <sub>5</sub>   | 2 | iso-C₃H <sub>7</sub>              | Н              | Н              |   |
|    | CI         | Н              | n-C₃H7                          | 0 | н .                               | н              | н              | СН₃   |
|    | CI -       | Н              | n-C <sub>3</sub> H <sub>7</sub> | 0 | Н                                 | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                                 |
| 20 | CI         | Н              | n-C₃H₂                          | 0 | Н                                 | Н              | н              | n-C <sub>3</sub> H <sub>7</sub>                               |
| 20 | CI         | Н              | n-C₃H₁                          | 0 | н                                 | Н              | Н              | iso-C₃H7  |
|    | CI         | H              | n-C <sub>3</sub> H <sub>7</sub> | 0 | Н                                 | Н              | Н              | n-C₄H₃  |
|    | CI         | Н              | n-C <sub>3</sub> H <sub>7</sub> | 0 | Н                                 | Н              | Н              | iso-C₄H₃  |
|    | CI         | Н              | n-C₃H <sub>7</sub>              | 0 | Н                                 | Н              | н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
| 25 | CI         | Н              | n-C₃H7                          | 0 | Н                                 | Н              | Н              | (CH₂)₃CI  |
|    | CI         | Н              | n-C <sub>3</sub> H <sub>7</sub> | 0 | Н                                 | Н              | Н              | CH₂CN   |
|    | CI         | Н              | n-C₃H₂                          | 0 | Н                                 | Н              | Н              | CH <sub>2</sub> OCH₃  |
|    | CI         | Н              | n-C <sub>3</sub> H <sub>7</sub> | 0 | Н                                 | Н              | н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
| 30 | CI         | Н              | n-C₃H₂                          | 0 | Н                                 | Н              | Н              | $\overline{}$   |
|    | CI         | н              | n-C <sub>3</sub> H <sub>7</sub> | 0 | Н                                 | н              | н              | - <del>CH</del> ₃   |
| 35 | CI         | Н              | n-C₃H7                          | 0 | Н                                 | н              | H              | C <sub>6</sub> H <sub>5</sub>                                 |
|    | CI         | Н              | n-C <sub>3</sub> H <sub>7</sub> | 0 | н                                 | Н              | н              |   |
|    | CI         | Н              | n-C <sub>3</sub> H <sub>7</sub> | 1 | Н                                 | Н              | Н              | CH₃   |
| 40 | CI         | Н              | n-C₃H₁                          | 1 | Н                                 | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                                 |
| •  | CI         | Н              | n-C₃H <del>7</del>              | 1 | Н                                 | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|    | CI         | Н              | n-C <sub>3</sub> H <sub>7</sub> | 1 | Н                                 | Н              | н              | iso-C₃H <sub>7</sub>  |
|    | CI         | Н              | n-C₃H <sub>7</sub>              | 1 | Н                                 | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
| 45 | CI         | Н              | n-C₃H₁                          | 1 | Н                                 | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
| .5 | CI         | Н              | n-C₃H₁                          | 1 | н                                 | Н              | н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | CI         | Н              | n-C₃H₁                          | 1 | Н                                 | Н              | Н              | (CH₂)₃CI  |
|    | CI         | Н              | n-C <sub>3</sub> H <sub>7</sub> | 1 | Н                                 | Н              | Н              | CH₂CN   |
|    | CI         | Н              | n-C₃H₁                          | 1 | Н                                 | Н              | Н              | CH <sub>2</sub> OCH₃  |
| 50 | CI         | Н              | n-C <sub>3</sub> H <sub>7</sub> | 1 | Н                                 | Н              | Н              | CH2CO2C2H5  |
|    | CI         | Н              | n-C₃H₁                          | 1 | н                                 | Н              | Н              | $\rightarrow$   |

Table 2 (continued)

|    |            |                |                                 |     |                |                    |                | _   |
|----|------------|----------------|---------------------------------|-----|----------------|--------------------|----------------|---|
| _  | <u>B</u> 1 | R <sup>2</sup> | _R <sup>3</sup>                 | n   | R <sup>5</sup> | <br>A <sub>6</sub> | R <sup>7</sup> | R <sup>8</sup>  |
| 5  | CI         | н              | n-C <sub>2</sub> H <sub>7</sub> | 1   | Н              | Н                  | н              | CH <sub>3</sub>   |
|    | ٥.         |                |                                 |     |                |                    |                |   |
|    | CI         | Н              | n-C₃H₁                          | 1   | Н              | Н                  | н              | C <sub>6</sub> H <sub>5</sub>                                 |
| 10 | CI         | Н              | n-C₃H₁                          | 1   | Н              | Н                  | н              | - <b>⟨</b> ->-cı  |
|    | CI         | н              | n-C <sub>3</sub> H <sub>7</sub> | 2   | Н              | н                  | н              | CH <sub>3</sub>   |
|    | CI         | Н              | n-C <sub>3</sub> H <sub>7</sub> | 2   | Н              | Н                  | н              | C₂H₅  |
| ,  | CI         | Н              | n-C <sub>3</sub> H <sub>7</sub> | 2   | Н              | Н                  | Н              | n-C₃H <sub>7</sub>  |
| 15 | CI         | Н              | n-C <sub>3</sub> H <sub>7</sub> | 2   | Н              | , H                | Н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
|    | CI         | Н              | n-C₃H7                          | 2   | Н              | Н                  | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|    | CI         | Н              | n-C <sub>3</sub> H <sub>7</sub> | 2   | Н              | Н                  | н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
| -  | CI         | Н              | n-C <sub>3</sub> H <sub>7</sub> | 2   | Н              | Н                  | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
| 20 | CI         | Н              | n-C <sub>3</sub> H <sub>7</sub> | 2 · | Н              | Н                  | н              | (CH₂)₃CI  |
|    | CI         | Н              | n-C <sub>3</sub> H <sub>7</sub> | 2   | Н              | Н                  | Н              | CH₂CN   |
|    | CI         | Н              | n-C <sub>3</sub> H <sub>7</sub> | 2   | Н              | Н                  | Н              | CH₂OCH₃   |
|    | CI         | Н              | n-C <sub>2</sub> H <sub>7</sub> | 2   | Н              | Н                  | Н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
| 25 | CI         | Н              | n-C₃H₁                          | 2   | Н              | Н                  | Н              | $\overline{}$   |
|    | CI         | Н              | n-C <sub>3</sub> H <sub>7</sub> | 2   | Н              | Н                  | н              | → CH <sub>3</sub>   |
|    | CI         | Н              | n-C <sub>3</sub> H <sub>7</sub> | 2   | н              | Н                  | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
| 30 | CI         | Н              | n-C <sub>3</sub> H <sub>7</sub> | 2   | Н              | н                  | Н              | ()-cı   |
|    | CI         | Н              | CH₂F                            | 0   | н              | н                  | н              | CH <sub>3</sub>   |
|    | CI         | Н              | CH₂F                            | 0   | Н              | н                  | Н              | C₂Hs  |
| 35 | CI         | Н              | CH₂F                            | 0   | Н              | Н                  | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|    | CI         | Н              | CH₂F                            | 0   | Н              | Н                  | Н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
|    | CI         | Н              | CH₂F                            | 0   | Н              | Н                  | Н              | n-C₄H₃  |
|    | CI         | Н              | CH₂F                            | 0   | Н              | <br>н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
| 40 | CI         | Н              | CH₂F                            | 0   | Н              | Н                  | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
| 40 | CI         | Н              | CH₂F                            | 0   | Н              | Н                  | н              | (CH₂)₃Cl  |
|    | CI         | Н              | CH₂F                            | 0   | Н              | Н                  | Н              | CH₂CN   |
|    | CI         | Н              | CH₂F                            | 0   | Н              | Н                  | Н              | CH <sub>2</sub> OCH <sub>3</sub>                              |
|    | CI         | Н              | CH₂F                            | 0   | Н              | Н                  | H              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
| 45 | CI         | Н              | CH₂F                            | 0   | Н              | н                  | н              | $\overline{}$   |
|    | CI         | Н              | CH₂F                            | 0   | н              | н                  | н              | - <del>CH</del> ₃   |
| 50 | . CI       | н              | CH₂F                            | 0   | н              | н                  | н              | CeHs  |
|    | CI         | Н              | CH₂F                            | 0   | Н              | Н                  | н              | -{-}-cı   |

Table 2 (continued)

| 5  | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>   | n | R <sup>5</sup> | <br>R <sup>6</sup> | R <sup>7</sup> | R <sup>8 ,</sup>  |
|----|----------------|----------------|------------------|---|----------------|--------------------|----------------|---|
| 5  | CI             | Н              | CH₂F             | 1 | Н              | Н                  | Н              | CH <sub>3</sub>   |
|    | CI             | Н              | CH₂F             | 1 | Н              | Н                  | Н              | C₂Hs  |
|    | CI             | Н              | CH₂F             | 1 | Н              | н                  | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|    | CI             | Н              | CH₂F             | 1 | Н              | Н                  | Н              | iso-C₃H7  |
| 10 | CI             | Н              | CH₂F             | 1 | Н              | Н                  | Н              | n-C₄H₃  |
|    | CI             | Н              | CH₂F             | 1 | Н              | Н                  | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
|    | CI             | Н              | CH₂F             | 1 | н              | Н                  | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | CI             | Н              | CH₂F             | 1 | Н              | Н                  | Н              | (CH₂)₃Cl  |
|    | CI             | Н              | CH₂F             | 1 | Н              | Н                  | н              | CH₂CN   |
| 15 | CI             | Н              | CH₂F             | 1 | Н              | Н                  | н              | CH <sub>2</sub> OCH₃  |
|    | CI             | Н              | CH₂F             | 1 | Н              | H                  | Н              | CH2CO2C2H5  |
|    | Cl             | Н              | CH₂F             | 1 | Н              | Н                  | Н              | $\overline{}$   |
|    |                |                |                  |   |                |                    |                | CH3   |
| 20 | CI             | Н              | CH₂F             | 1 | Н              | Н                  | н              | <b>→</b>  |
|    | CI             | н              | CH₂F             | 1 | Н              | н                  | н              | C <sub>6</sub> Hs   |
|    | CI             | Н              | CH₂F             |   | Н              |                    |                | O 01 15   |
|    | Ci             | п              | CH2F             | 1 | п              | Н                  | Н              | (_)>-cı   |
| 25 | CI             | Н              | CH₂F             | 2 | н              | Н                  | Н              | CH <sub>3</sub>   |
|    | CI             | Н              | CH₂F             | 2 | н              | H                  | H              | C₂Hs  |
|    | CI             | н              | CH₂F             | 2 | Н              | Н                  | н              | n-C₃H <sub>7</sub>  |
|    | CI             | Н              | CH₂F             | 2 | н              | н                  | H              | iso-C <sub>3</sub> H <sub>7</sub>                             |
| 30 | CI             | Н              | CH₂F             | 2 | Н              | Н                  | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|    | CI             | Н              | CH₂F             | 2 | Н              | Н                  | н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
|    | CI             | Н              | CH₂F             | 2 | Н              | н                  | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | CI             | Н              | CH₂F             | 2 | Н              | н                  | Н              | (CH₂)₃CI  |
| 35 | CI             | Н              | CH₂F             | 2 | Н              | н                  | н              | CH₂CN   |
| 33 | CI             | Н              | CH₂F             | 2 | Н              | н                  | н              | CH₂OCH₃   |
|    | CI             | Н              | CH₂F             | 2 | Н              | Н                  | н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | CI             | Н              | CH₂F             | 2 | Н              | Н                  | н              | $\overline{}$   |
| 40 |                |                |                  |   |                |                    |                | ,СН <sub>3</sub>  |
|    | CI             | Н              | CH₂F             | 2 | Н              | Н                  | Н              | $\leftarrow$  |
|    | CI             | Н              | CH₂F             | 2 | н              | H                  | н              | C <sub>6</sub> H <sub>5</sub>                                 |
|    |                |                |                  |   |                |                    |                |   |
| 45 | CI             | Н              | CH₂F             | 2 | Н              | Н                  | H              | ()-CI   |
|    | CI             | н              | CHF₂             | 0 | н              | Н                  | Н              | СН₃   |
|    | CI             | Н              | CHF <sub>2</sub> | 0 | Н              | н                  | н              | C <sub>2</sub> H <sub>5</sub>                                 |
|    | CI             | Н              | CHF₂             | 0 | Н              | Н                  | Н              | n-C₃H <sub>7</sub>  |
| 50 | CI             | Н              | CHF₂             | 0 | Н              | Н                  | Н              | iso-C₃H <sub>7</sub>  |
|    | CI             | Н              | CHF₂             | 0 | Н              | н                  | Н              | n-C₄H <sub>9</sub>  |
|    | CI             | Н              | CHF₂             | 0 | н              | н                  | H              | iso-C₄H₃  |

Table 2 (continued)

|    | B <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>   | n | R <sup>5</sup> | <br>·R <sup>6</sup> | R <sup>7</sup> | -R <sup>8</sup>                    |
|----|----------------|----------------|------------------|---|----------------|---------------------|----------------|------------------------------------|
| 5  | CI             | Н              | CHF <sub>2</sub> | 0 | Н              | Н                   | H ·            | tert-C₄H₀                          |
|    | CI             | Н              | CHF₂             | 0 | Н              | н                   | н              | (CH₂)₃CI                           |
|    | CI             | Н              | CHF <sub>2</sub> | 0 | Н              | н                   | н              | CH₂CN                              |
|    | CI             | Н              | CHF <sub>2</sub> | 0 | Н              | н                   | н              | CH <sub>2</sub> OCH₃               |
| 10 | Ci             | н              | CHF <sub>2</sub> | 0 | Н              | Н                   | Н              | CH2CO2C2H5                         |
|    | CI             | Н              | CHF₂             | 0 | Н              | Н                   | Н              | $\overline{}$                      |
|    | CI             | н              | CHF₂             | 0 | Н              | н                   | н              | CH₃                                |
| 15 | CI             | н              | CHF₂             | 0 | н              | н                   | н              | C <sub>6</sub> H <sub>5</sub>      |
|    | CI             | н              | CHF₂             | 0 | Н              | Н                   | Н              | -√_>-cı                            |
|    | CI             | Н              | CHF₂             | 1 | н              | н                   | н              | СНз                                |
| 20 | CI             | н              | CHF₂             | 1 | Н              | Н                   | Н              | C <sub>2</sub> H <sub>5</sub>      |
|    | CI             | Н              | CHF <sub>2</sub> | 1 | Н              | н                   | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
|    | CI             | н              | CHF₂             | 1 | Н              | Н                   | н              | iso-C <sub>3</sub> H <sub>7</sub>  |
|    | CI             | Н              | CHF <sub>2</sub> | 1 | Н              | Н                   | Н              | n-C <sub>4</sub> H <sub>9</sub>    |
| 25 | CI             | Н              | CHF₂             | 1 | Н              | Н                   | Н              | iso-C <sub>4</sub> H <sub>9</sub>  |
|    | CI             | Н              | CHF <sub>2</sub> | 1 | Н              | Н                   | н              | tert-C <sub>4</sub> H <sub>9</sub> |
|    | CI             | Н              | CHF₂             | 1 | Н              | н                   | н              | (CH₂)₃CI                           |
|    | CI             | Н              | CHF <sub>2</sub> | 1 | Н              | Н                   | Н              | CH₂CN                              |
|    | CI             | Н              | CHF₂             | 1 | Н              | Н                   | Н              | CH <sub>2</sub> OCH₃               |
| 30 | CI             | Н              | CHF₂             | 1 | Н              | Н                   | н              | CH2CO2C2H5                         |
|    | CI             | Н              | CHF <sub>2</sub> | 1 | Н              | Н                   | н              | $\overline{}$                      |
| 35 | CI             | н              | CHF₂             | 1 | н              | н                   | н              | → CH,                              |
|    | CI             | Н              | CHF₂             | 1 | Н              | н                   | Н              | C <sub>6</sub> H <sub>5</sub>      |
|    | CI             | Н              | CHF₂             | 1 | н              | н                   | Н              |                                    |
| 40 | CI             | Н              | CHF₂             | 2 | Н              | Н                   | Н              | СНэ                                |
|    | CI             | Н              | CHF <sub>2</sub> | 2 | Н              | Н                   | Н              | C <sub>2</sub> H <sub>5</sub>      |
|    | CI             | Н              | CHF <sub>2</sub> | 2 | Н              | Н                   | H              | n-C <sub>3</sub> H <sub>7</sub>    |
|    | CI             | Н              | CHF₂             | 2 | Н              | Н                   | Н              | iso-C <sub>3</sub> H <sub>7</sub>  |
| 45 | CI             | Н              | CHF₂             | 2 | Н              | н .                 |                | n-C <sub>4</sub> H <sub>9</sub>    |
|    | CI             | Н              | CHF₂             | 2 | Н              | Н                   | Н              | iso-C <sub>4</sub> H <sub>9</sub>  |
|    | CI             | Н              | CHF <sub>2</sub> | 2 | Н              | Н                   | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
|    | CI             | Н              | CHF₂             | 2 | Н              | Н                   | Н              | (CH₂)₃CI                           |
|    | CI             | Н              | CHF₂             | 2 | Н              | Н                   | Н              | CH₂CN                              |
| 50 | CI             | Н              | CHF₂             | 2 | Н              | Н                   | Н              | CH <sub>2</sub> OCH₃               |
|    | CI             | Н              | CHF₂             | 2 | Н              | Н                   | Н              | CH2CO2C2H5                         |

Table 2 (continued)

|    | <u>R</u> 1 | R <sup>2</sup> | _R <sup>3</sup>                   | n | R <sup>5</sup> | <br>R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>                     |
|----|------------|----------------|-----------------------------------|---|----------------|--------------------|----------------|------------------------------------|
| 5  | CI         | Н              | CHF₂                              | 2 | Н              | Н                  | Н              | $\neg \neg$                        |
|    | CI         | н              | CHF₂                              | 2 | н              | н                  | Н              | ĊH₃                                |
| 10 | CI         | Н              | CHF₂                              | 2 | н              | Н                  | н              | C <sub>6</sub> H <sub>5</sub>      |
|    | CI         | Н              | CHF₂                              | 2 | н              | Н                  | Н              | ()-cı                              |
| •  | CI         | н              | CF₃                               | 0 | н              | Н                  | н              | CH₃                                |
| 15 | CI         | Н              | CH₂CH₂F                           | 0 | н              | Н                  | . <b>H</b>     | CH <sub>3</sub>                    |
|    | CI         | Н              | . CH₂CH₂F                         | 0 | Н              | н                  | Н              | C₂Hs                               |
|    | CI         | Н              | CH₂CH₂F                           | 0 | Н              | н                  | Н              | n-C₃H <sub>7</sub>                 |
|    | CI         | Н              | CH₂CH₂F                           | 0 | н              | н                  | Н              | iso-C₃H <sub>7</sub>               |
| 20 | CI         | Н              | CH₂CH₂F                           | 0 | н              | Н                  | н              | n-C <sub>4</sub> H <sub>9</sub>    |
| 20 | CI         | Н              | CH₂CH₂F                           | 0 | Н              | Н                  | Н              | iso-C <sub>4</sub> H <sub>9</sub>  |
|    | CI         | н              | CH₂CH₂F                           | 0 | Н              | Н                  | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
|    | CI         | Н              | CH₂CH₂F                           | 0 | н              | Н                  | Н              | (CH <sub>2</sub> ) <sub>3</sub> Cl |
|    | CI         | Н              | CH₂CH₂F                           | 0 | Н              | Н                  | н              | CH₂CN                              |
| 25 | CI         | Н              | CH₂CH₂F                           | 0 | н              | Н                  | Н              | CH <sub>2</sub> OCH <sub>3</sub>   |
|    | CI         | Н              | CH₂CH₂F                           | 0 | Н              | Н                  | Н              | CH2CO2C2H5                         |
|    | CI         | Н              | CH <sub>2</sub> CH <sub>2</sub> F | 0 | Н              | Н                  | н              | 1                                  |
|    |            |                |                                   | • | •••            | ••                 | • •            |                                    |
| 30 | CI         | Н              | CH₂CH₂F                           | 0 | н              | Н                  | н              | → CH,                              |
|    | CI         | Н              | CH₂CH₂F                           | 0 | н              | Н                  | н              | C <sub>6</sub> H <sub>5</sub>      |
| 35 | CI         | Н              | CH₂CH₂F                           | 0 | Н              | Н                  | н              | ()-cı                              |
| •  | CI         | н              | CH₂CH₂F                           | 1 | н              | н                  | 1.1            | CU                                 |
|    | CI         | Н              | CH₂CH₂F                           | 1 | Н              |                    | Н              | CH <sub>3</sub>                    |
|    | CI         | н              | CH <sub>2</sub> CH <sub>2</sub> F | 1 | Н              | Н                  | Н              | C₂H₅                               |
|    | CI         | н              | CH₂CH₂F                           | 1 |                | Н                  | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
| 40 | CI         | Н              |                                   | 1 | Н              | Н                  | н              | iso-C₃H <sub>7</sub>               |
|    | CI         | Н              | CH₂CH₂F                           |   | Н              | Н                  | Н              | n-C <sub>4</sub> H <sub>9</sub>    |
|    | CI         | Н              | CH₂CH₂F                           | 1 | Н              | Н                  | н              | iso-C <sub>4</sub> H <sub>9</sub>  |
|    | CI         |                | CH₂CH₂F                           | 1 | Н              | Н                  | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
| 45 |            | Н              | CH₂CH₂F                           | 1 | Н              | Н                  | Н              | (CH₂)₃CI                           |
|    | CI         | Н              | CH₂CH₂F                           | 1 | Н              | Н                  | H              | CH₂CN                              |
|    | CI         | Н              | CH₂CH₂F                           | 1 | Н              | Н                  | Н              | CH <sub>2</sub> OCH <sub>3</sub>   |
|    | CI         | Н              | CH₂CH₂F                           | 1 | Н              | Н                  | Н              | CH₂CO₂C₂H₅                         |
|    | CI         | Н              | CH₂CH₂F                           | 1 | Н              | Н                  | Н              | $\neg \triangleleft$               |
| 50 | CI         | н              | CH₂CH₂F                           | 1 | н              | н                  | н              | _CH₃                               |

Table 2 (continued)

|    | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>                   | n | R <sup>5</sup> |   | R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>  |
|----|----------------|----------------|----------------------------------|---|----------------|---|----------------|----------------|---|
| 5  | CI             | н              | CH₂CH₂F                          | 1 | Н              |   | н              | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
|    | CI             | Н              | CH₂CH₂F                          | 1 | Н              |   | Н              | Н              | — <b>(_</b> )−CI  |
|    | CI             | Н              | CH₂CH₂F                          | 2 | Н              |   | н              | Н              | CH₃   |
| 10 | CI             | Н              | CH₂CH₂F                          | 2 | Н              |   | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                                 |
|    | CI             | Н              | CH₂CH₂F                          | 2 | Н              |   | Н              | Н              | n-C₃H <sub>7</sub>  |
|    | CI             | Н              | CH₂CH₂F                          | 2 | Н              |   | н              | Н              | iso-C₃H7  |
|    | CI             | Н              | CH₂CH₂F                          | 2 | Н              |   | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|    | CI             | Н              | CH₂CH₂F                          | 2 | Н              |   | н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
| 15 | CI             | Н              | CH₂CH₂F                          | 2 | Н              |   | н              | н              | tert-C₄H₀   |
|    | CI             | Н              | CH₂CH₂F                          | 2 | н              |   | Н              | Н              | (CH₂)₃CI  |
|    | CI             | Н              | CH₂CH₂F                          | 2 | Н              |   | Н              | Н              | CH₂CN   |
| -  | CI             | н              | CH₂CH₂F                          | 2 | н              |   | н              | Н              | CH₂OCH₃   |
| 20 | CI             | Н              | CH₂CH₂F                          | 2 | Н              |   | Н              | Н              | CH2CO2C2H5  |
|    | CI             | Н              | CH₂CH₂F                          | 2 | Н              |   | Н              | Н              | $\overline{}$   |
| 25 | CI             | Н              | CH₂CH₂F                          | 2 | н              |   | н              | н              | - <del>CH³</del>  |
| 25 | CI             | Н              | CH₂CH₂F                          | 2 | н              |   | Н              | н              | C <sub>6</sub> H <sub>5</sub>                                 |
|    | CI             | н              | CH₂CH₂F                          | 2 | н              |   | н              | Н              |   |
|    | Ci             | Н              | CH₂CHF₂                          | 0 | н              |   | н              | н              | CH₃   |
| 30 | CI             | Н              | CH₂CHF₂                          | 0 | Н              |   | Н              | н              | C <sub>2</sub> H <sub>5</sub>                                 |
|    | CI             | Н              | CH₂CHF₂                          | 0 | Н              |   | Н              | н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|    | CI             | Н              | CH₂CHF₂                          | 0 | H              |   | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
|    | CI             | Н              | CH₂CHF₂                          | 0 | Н              |   | Н              | н              | n-C <sub>4</sub> H <sub>9</sub>                               |
| 35 | CI             | Н              | CH₂CHF₂                          | 0 | Н              |   | Н              | Н              | iso-C4H9  |
|    | CI             | Н              | CH₂CHF₂                          | 0 | Н              |   | Н              | Н              | tert-C₄H <sub>9</sub>   |
|    | CI             | Н              | CH₂CHF₂                          | 0 | Н              |   | Н              | Н              | (CH₂)₃CI  |
|    | CI             | Н              | CH₂CHF₂                          | 0 | Н              |   | H              | Н              | CH₂CN   |
| 40 | CI             | Н              | CH₂CHF₂                          | 0 | Н              |   | Н              | Н              | CH₂OCH₃   |
| 40 | CI             | Н              | CH₂CHF₂                          | 0 | Н              |   | Н              | Н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | CI             | Н              | CH₂CHF₂                          | 0 | Н              |   | Н              | Н              | $\overline{}$   |
| 45 | CI             | Н              | CH₂CHF₂                          | 0 | н              |   | н              | н              | ←CH³  |
|    | CI             | Н              | CH₂CHF₂                          | 0 | Н              | • | н              | Ĥ              | C <sub>6</sub> H <sub>5</sub>                                 |
|    | CI             | н              | CH <sub>2</sub> CHF <sub>2</sub> | 0 | Н              |   | н              | H              | ()-cı   |
| 50 | CI             | н              | CH₂CHF₂                          | 1 | Н              |   | н              | н              | CH <sub>3</sub>   |
|    | CI             | Н              | CH₂CHF₂                          | 1 | Н              |   | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                                 |
|    | CI             | Н              | CH₂CHF₂                          | 1 | Н              |   | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |

Table 2 (continued)

| 5  | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>                   | n | R <sup>5</sup> | R <sup>6</sup> | R <sup>7</sup> | R <sup>8 -</sup>  |
|----|----------------|----------------|----------------------------------|---|----------------|----------------|----------------|---|
|    | CI             | Н              | CH <sub>2</sub> CHF <sub>2</sub> | 1 | Н              | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
|    | CI             | Н              | CH₂CHF₂                          | 1 | Н              | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|    | CI             | Н              | CH₂CHF₂                          | 1 | Н              | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
|    | CI             | Н              | CH₂CHF₂                          | 1 | Н              | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
| 10 | CI             | Н              | CH₂CHF₂                          | 1 | Н              | Н              | Н              | (CH₂)₃CI  |
|    | CI             | Н              | CH₂CHF₂                          | 1 | Н              | Н              | Н              | CH₂CN   |
|    | CI             | Н              | CH₂CHF₂                          | 1 | Н              | Н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>                              |
|    | CI             | Н              | CH₂CHF₂                          | 1 | Н              | Н              | Н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
| 15 | CI             | Н              | CH <sub>2</sub> CHF <sub>2</sub> | 1 | Н              | н              | Н              | $\overline{}$   |
|    | CI             | Н              | CH₂CHF₂                          | 1 | н              | Н              | Н              | CH₃<br>→  |
| 20 | CI             | Н              | CH₂CHF₂                          | 1 | Н              | Н              | н              | C <sub>6</sub> H <sub>5</sub>                                 |
|    | CI             | Н              | CH <sub>2</sub> CHF <sub>2</sub> | 1 | н              | Н              | Н              | -√_>-cı   |
|    | CI             | Н              | CH₂CHF₂                          | 2 | Н              | н              | Н              | CH <sub>3</sub>   |
|    | CI             | Н              | CH₂CHF₂                          | 2 | Н              | Н              | Н              | C₂Hs  |
| 25 | CI             | Н              | CH₂CHF₂                          | 2 | Н              | Н              | Н              | n-C₃H₁  |
|    | Cl             | Н              | CH₂CHF₂                          | 2 | Н              | Н              | Н              | iso-C₃H <sub>7</sub>  |
|    | CI             | Н              | CH <sub>2</sub> CHF <sub>2</sub> | 2 | Н              | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|    | CI             | Н              | CH <sub>2</sub> CHF <sub>2</sub> | 2 | Н              | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
| 30 | CI             | Н              | CH₂CHF₂                          | 2 | Н              | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | Cl             | Н              | CH₂CHF₂                          | 2 | Н              | Н              | Н              | (CH₂)₃CI  |
|    | CI             | Н              | CH₂CHF₂                          | 2 | Н              | Н              | Н              | CH₂CN   |
|    | CI             | Н              | CH₂CHF₂                          | 2 | Н              | Н              | Н              | CH <sub>2</sub> OCH₃  |
|    | CI             | Н              | CH₂CHF₂                          | 2 | Н              | Н              | н              | CH2CO2C2H5  |
| 35 | CI             | Н              | CH <sub>2</sub> CHF <sub>2</sub> | 2 | Н              | Н              | Н              | $\neg \triangleleft$  |
|    | CI             | н              | CH₂CHF₂                          | 2 | н              | Н              | н              | → CH³   |
| 40 | CI             | Н              | CH <sub>2</sub> CHF <sub>2</sub> | 2 | н              | н              | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
|    | CI             | Н              | CH <sub>2</sub> CHF <sub>2</sub> | 2 | Н              | Н              | Н              | - <b>√_</b> >-CI  |
|    | CI             | Н              | CH₂CF₃                           | 0 | Н              | н              | Н              | CH <sub>3</sub>   |
| 45 | CI             | Н              | CH₂CF₃                           | 0 | Н              | н              | Н              | C <sub>2</sub> H <sub>5</sub>                                 |
|    | CI             | Н              | CH₂CF₃                           | 0 | Н              | Н              | н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|    | CI             | Н              | CH₂CF₃                           | 0 | Н              | н              | н              | iso-C₃H <sub>7</sub>  |
|    | CI             | Н              | CH₂CF₃                           | 0 | н              | Н              | н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|    | CI             | Н              | CH <sub>2</sub> CF <sub>3</sub>  | 0 | Н              | Н              | н              | iso-C₄H₀  |
| 50 | CI             | Н              | CH₂CF₃                           | 0 | Н              | н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | CI             | Н              | CH₂CF₃                           | 0 | Н              | Н              | Н              | (CH₂)₃CI  |

Table 2 (continued)

| 5   | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>                  | n | R <sup>5</sup> | R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>  |
|-----|----------------|----------------|---------------------------------|---|----------------|----------------|----------------|---|
|     | CI             | Н              | CH <sub>2</sub> CF <sub>3</sub> | 0 | Н              | Н              | Н              | CH₂CN   |
|     | Cl             | Н              | CH <sub>2</sub> CF <sub>3</sub> | 0 | Н              | H              | Н              | CH₂OCH₃   |
|     | CI             | Н              | CH <sub>2</sub> CF <sub>3</sub> | 0 | н              | Н              | Н              | CH2CO2C2H5  |
| 10  | CI             | Н              | CH₂CF₃                          | 0 | Н              | Н              | Н              | $\neg \triangleleft$  |
| 10  | CI             | н              | CH₂CF₃                          | 0 | Н              | н              | н              | <del>с</del> ң,   |
|     | CI             | Н              | CH₂CF₃                          | 0 | Н              | н              | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
| 15  | CI             | Н              | CH₂CF₃                          | 0 | Н              | Н              | Н              |   |
|     | CI             | н              | CH₂CF₃                          | 1 | н              | Н              | н              | СН₃   |
|     | CI             | Н              | CH₂CF₃                          | 1 | Н              | Н              | Н              | C₂Hs  |
| 20  | CI             | Н              | CH₂CF₃                          | 1 | Н              | Н              | Н              | n-C₃H7  |
|     | CI             | Н              | CH₂CF₃                          | 1 | H              | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
|     | CI             | Н              | CH₂CF₃                          | 1 | Н              | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|     | CI             | Н              | CH₂CF₃                          | 1 | Н              | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
| 25  | CI             | Н              | CH₂CF₃                          | 1 | Н              | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|     | CI             | Н              | CH₂CF₃                          | 1 | Н              | Н              | Н              | (CH₂)₃CI  |
|     | CI             | Н              | CH₂CF₃                          | 1 | Н              | Н              | Н              | CH₂CN   |
|     | CI             | Н              | CH₂CF₃                          | 1 | Н              | Н              | Н              | CH <sub>2</sub> OCH₃  |
| 30  | CI             | Н              | CH₂CF₃                          | 1 | Н              | Н              | Н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
| 30  | CI             | Н              | CH₂CF₃                          | 1 | Н              | Н              | Н              | $\overline{}$   |
|     | CI             | Н              | CH <sub>2</sub> CF <sub>3</sub> | 1 | н              | н              | н              | → CH³   |
| 35  | CI             | Н              | CH₂CF₃                          | 1 | н              | Н              | н              | C <sub>6</sub> H <sub>5</sub>                                 |
|     | CI             | Н              | CH₂CF₃                          | 1 | Н              | Н              | Н              | (>-cı   |
|     | CI             | н              | CH₂CF₃                          | 2 | н              | Н              | н              | CH₃   |
| 40  | CI             | Н              | CH₂CF₃                          | 2 | Н              | Н              | Н              | C₂H₅  |
|     | CI             | Н              | CH₂CF₃                          | 2 | Н              | Н              | Н              | n-C₃H₂  |
|     | CI             | Н              | CH <sub>2</sub> CF <sub>3</sub> | 2 | Н              | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
|     | CI             | Н              | CH₂CF₃                          | 2 | Н              | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
| 45  | CI             | Н              | CH <sub>2</sub> CF <sub>3</sub> | 2 | Н              | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
|     | CI             | Н              | CH₂CF₃                          | 2 | Н              | Н              | Н              | tert-C₄H₃   |
|     | CI             | Н              | CH <sub>2</sub> CF <sub>3</sub> | 2 | Н              | Н              | Н              | (CH₂)₃CI  |
|     | CI             | Н              | CH₂CF₃                          | 2 | Н              | Н              | Н              | CH₂CN   |
| 50  | CI             | Н              | CH₂CF₃                          | 2 | н              | Н              | Н              | CH <sub>2</sub> OCH₃  |
| - • | CI             | Н              | CH₂CF₃                          | 2 | H              | Н              | Н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|     | CI             | Н              | CH₂CF₃                          | 2 | Н              | Н              | Н              | $\neg \Box$   |

Table 2 (continued)

|               |                |                 |                                 |   |                | · == · · · · · · · · · · · · · · · · · |                |                | _                                  |
|---------------|----------------|-----------------|---------------------------------|---|----------------|--|----------------|----------------|------------------------------------|
| 5             | R <sup>1</sup> | R <sup>2</sup>  | R <sup>3</sup>                  | n | R <sup>S</sup> |  | R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>                     |
| 3             | CI             | Н               | CH₂CF₃                          | 2 | Н              |  | н              | Н              | CH <sub>3</sub>                    |
|               | ٠,             | ••              | 01/2013                         | ~ | ••             |  | П              | а              | $\leftarrow$                       |
|               | CI             | н               | CH CE                           | _ | .,             |  |                |                |                                    |
| 10            |                |                 | CH₂CF₃                          | 2 | Н              |  | Н              | H              | C <sub>6</sub> H <sub>5</sub>      |
| 10            | CI             | Н               | CH <sub>2</sub> CF <sub>3</sub> | 2 | Н              |  | Н              | Н              | ()>-cı                             |
|               | CI             | CH₃             | CH <sub>3</sub>                 | 0 | Н              |  | Н              | н              | CH₃                                |
|               | CI             | CH <sub>3</sub> | CH <sub>3</sub>                 | 1 | Н              |  | Н              | Н              | CH₃                                |
|               | CI             | CH <sub>3</sub> | CH <sub>3</sub>                 | 2 | н              |  | Н              | Н              | CH₃                                |
| 15            | Br             | Н               | CH <sub>3</sub>                 | 0 | Н              |  | Н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>   |
|               | Br             | Н               | CH <sub>3</sub>                 | 0 | Н              |  | Н              | н              | CH2CO2C2H5                         |
|               | Br             | Н               | CH <sub>3</sub>                 | 0 | Н              |  | Н              | н              | CH₃                                |
|               | Br             | Н               | CH <sub>3</sub>                 | 0 | н              |  | Н              | H              | C₂H₅                               |
| 20            | Br             | Н               | CH <sub>3</sub>                 | 0 | н              |  | Н              | н              | n-C <sub>3</sub> H <sub>7</sub>    |
|               | Br             | Н               | CH <sub>3</sub>                 | 0 | н              |  | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>  |
|               | Br             | Н               | CH <sub>3</sub>                 | 0 | н              |  | Н              | н              | n-C <sub>4</sub> H <sub>9</sub>    |
|               | Br             | Н               | CH <sub>3</sub>                 | 0 | Н              |  | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>  |
|               | Br             | Н               | CH <sub>3</sub>                 | 0 | н              |  | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>  |
| 25            | Br             | Н               | CH <sub>3</sub>                 | 0 | н              |  | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
|               | Br             | Н               | CH <sub>3</sub>                 | 0 | н              |  | н              | Н              | n-CsH <sub>11</sub>                |
|               | Br             | Н               | CH <sub>3</sub>                 | 0 | н              |  | Н              | Н              | n-C <sub>6</sub> H <sub>13</sub>   |
|               | Br             | Н               | CH <sub>3</sub>                 | 0 | Н              |  | н              | Н              | _1                                 |
| 30            |                |                 |                                 |   |                |  |                |                | 7                                  |
|               | Br             | Н               | CH <sub>3</sub>                 | 0 | Н              |  | Н              | Н              | CH <sub>3</sub>                    |
|               | _              |                 |                                 |   |                |  |                |                | <b>V</b>                           |
|               | Br             | Н               | CH <sub>3</sub>                 | 0 | Н              |  | Н              | Н              | -()                                |
| 35            | Br             | н               | СНз                             | 0 | н              |  | н              | н              | $\tilde{\wedge}$                   |
|               |                |                 |                                 |   |                |  |                |                | $\rightarrow$                      |
|               | Br<br>D-       | H               | CH <sub>3</sub>                 | 0 | Н              |  | Н              | Н              | C <sub>6</sub> H <sub>5</sub>      |
|               | Br             | Н               | CH <sub>3</sub>                 | 0 | Н              |  | Н              | Н              | - <b>√_</b> >-cı                   |
| 40            | Br             | 11              | 011                             | • |                |  |                |                | CI                                 |
|               | DI             | Н               | CH <sub>3</sub>                 | 0 | Н              |  | Н              | Н              |                                    |
|               |                |                 |                                 |   |                |  |                |                | <u></u> / 0,                       |
|               | Br             | Н               | CH <sub>3</sub>                 | 0 | н              |  | Н              | Н              | CH=CH₂                             |
| 45            | Br             | Н               | CH <sub>3</sub>                 | 0 | Н              |  | Н              | Н              | CH=CHCH₃                           |
| <del>70</del> | Br             | Н               | CH <sub>3</sub>                 | 0 | н              |  | Н              | H              | C(=CH₂)CH₃                         |
|               | Br             | Н               | CH <sub>3</sub>                 | 0 | Н              |  | Н              | Н              | CH=CHC6Hs                          |
|               | Br             | Н               | CH <sub>3</sub>                 | 0 | Н              |  | н              | Н              | -CH2-()-CI                         |
| <b>50</b>     | _              |                 |                                 |   |                |  |                |                |                                    |
| 50            | Br             | Н               | CH <sub>3</sub>                 | 0 | Н              |  | Н              | Н              | (CH₂)₄CI                           |
|               | Br<br>Ba       | Н               | CH <sub>3</sub>                 | 0 | H              |  | H              | Н              | (CH <sub>2</sub> ) <sub>3</sub> Cl |
|               | Br             | Н               | CH <sub>3</sub>                 | 0 | Н              |  | Н              | Н              | CH₂CN                              |
|               |                |                 |                                 |   |                |  |                |                | <u> •</u>                          |

Table 2 (continued)

| 5  | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>  | n | R <sup>5</sup>                  | R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>                                 |
|----|----------------|----------------|-----------------|---|---------------------------------|----------------|----------------|--|
| J  | Br             | Н              | CH <sub>3</sub> | 0 | Н                               | Н              | Н              | CH <sub>2</sub> OC <sub>6</sub> H <sub>5</sub> |
|    | Br             | Н              | CH <sub>3</sub> | 0 | CH <sub>3</sub>                 | Н              | Н              | CH₃  |
|    | Br             | Н              | CH <sub>3</sub> | 0 | CH <sub>3</sub>                 | Н              | Н              | C₂H₅   |
|    | Br             | Н              | CH <sub>3</sub> | 0 | CH <sub>3</sub>                 | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                |
| 10 | Br             | Н              | CH <sub>3</sub> | 0 | CH3                             | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>              |
|    | Br             | Н              | CH <sub>3</sub> | 0 | CH₃                             | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                |
|    | Br             | Н              | CH <sub>3</sub> | 0 | CH₃                             | Н              | H              | iso-C <sub>4</sub> H <sub>9</sub>              |
|    | Br             | Н              | CH <sub>3</sub> | 0 | CH <sub>3</sub>                 | Н              | H <sub>.</sub> | sec-C <sub>4</sub> H <sub>9</sub>              |
| 15 | Br             | Н              | CH <sub>3</sub> | 0 | CH <sub>3</sub>                 | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>             |
| 15 | Br             | Н              | CH <sub>3</sub> | 0 | CH <sub>3</sub>                 | Н              | Н              | (CH₂)₃CI                                       |
|    | Br             | Н              | CH <sub>3</sub> | 0 | CH <sub>3</sub>                 | Н              | Н              | (CH₂)₄Cl                                       |
|    | Br             | Н              | CH <sub>3</sub> | 0 | CH <sub>3</sub>                 | Н              | н              | CH₂CN  |
| •  | Br             | Н              | CH₃             | 0 | CH <sub>3</sub>                 | Н              | Н              | CH₂CO₂C₂H₅                                     |
| 20 | Br             | Н              | CH <sub>3</sub> | 0 | CH <sub>3</sub>                 | Н              | Н              | CH₂OCH₃  |
|    | Br             | Н              | CH₃             | 0 | CH <sub>3</sub>                 | Н              | Н              | C <sub>6</sub> H <sub>5</sub>                  |
|    | Br             | Н              | CH <sub>3</sub> | 0 | CH <sub>3</sub>                 | Н              | Н              | <b>⟨</b> _>-cı                                 |
| 05 | Br             | Н              | CH₃             | 0 | C₂H₅                            | Н              | н              | CH₃  |
| 25 | Br             | Н              | CH <sub>3</sub> | 0 | C <sub>2</sub> H <sub>5</sub>   | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                  |
|    | Br             | Н              | CH <sub>3</sub> | 0 | C <sub>2</sub> H <sub>5</sub>   | Н              | н              | n-C <sub>3</sub> H <sub>7</sub>                |
|    | Br             | Н              | CH <sub>3</sub> | 0 | C <sub>2</sub> H <sub>5</sub>   | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>              |
|    | Br             | Н              | CH₃             | 0 | C₂H₅                            | Н              | н              | n-C <sub>4</sub> H <sub>9</sub>                |
| 30 | Br             | Н              | CH₃             | 0 | C₂H₅                            | Н              | Н              | iso-C₄H₃                                       |
|    | Br             | Н              | CH <sub>3</sub> | 0 | C₂H₅                            | Η.             | Н              | sec-C <sub>4</sub> H <sub>9</sub>              |
|    | Br             | Н              | CH <sub>3</sub> | 0 | C <sub>2</sub> H <sub>5</sub>   | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>             |
|    | Br             | Н              | CH <sub>3</sub> | 0 | C <sub>2</sub> H <sub>5</sub>   | Н              | Н              | (CH₂)₃CI                                       |
| 35 | Br             | Н              | CH <sub>3</sub> | 0 | C₂H₅                            | Н              | Н              | (CH₂)₄CI                                       |
| 00 | Br             | Н              | CH <sub>3</sub> | 0 | C₂Hs                            | Н              | Н              | CH₂CN  |
|    | Br             | Н              | CH <sub>3</sub> | 0 | C <sub>2</sub> H <sub>5</sub>   | Н              | Н              | CH2CO2C2H5                                     |
|    | Br             | Н              | CH <sub>3</sub> | 0 | C₂H₅                            | н              | Н              | CH2OCH3  |
|    | Br             | Н              | CH <sub>3</sub> | 0 | C₂H₅                            | Н              | Н              | C <sub>6</sub> H <sub>5</sub>                  |
| 40 | Br             | Н              | CH <sub>3</sub> | 0 | C <sub>2</sub> H <sub>5</sub>   | Н              | Н              | - <b>√_</b> >-cı                               |
|    | Br             | Н              | CH <sub>3</sub> | 0 | n-C₃H <sub>7</sub>              | н              | н              | CH <sub>3</sub>                                |
|    | Br             | Н              | CH <sub>3</sub> | 0 | n-C₃H <sub>7</sub>              | Н              | н              | C₂Hs   |
| 45 | Br             | Н              | CH <sub>3</sub> | 0 | n-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                |
| 40 | Br             | Н              | CH <sub>3</sub> | 0 | n-C <sub>3</sub> H <sub>7</sub> | Н              | H              | iso-C <sub>3</sub> H <sub>7</sub>              |
|    | Br             | Н              | CH <sub>3</sub> | 0 | n-C <sub>3</sub> H <sub>7</sub> | H              | Н              | n-C <sub>4</sub> H <sub>9</sub>                |
|    | Br             | Н              | CH <sub>3</sub> | 0 | n-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>              |
|    | Br             | Н              | CH <sub>3</sub> | 0 | n-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>              |
| 50 | Br             | Н              | CH <sub>3</sub> | 0 | n-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>             |
|    | Br             | Н              | CH <sub>3</sub> | 0 | n-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | (CH₂)₃CI                                       |
|    | Br             | Н              | CH <sub>3</sub> | 0 | n-C <sub>3</sub> H <sub>7</sub> | н              | Н              | (CH₂)₄CI                                       |

Table 2 (continued)

| 5          | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>  | n | R <sup>5</sup>                                 | R <sup>6</sup> | R <sup>7</sup> _ | R <sup>8</sup>  |
|------------|----------------|----------------|-----------------|---|--|----------------|------------------|---|
| J          | Br             | Н              | CH <sub>3</sub> | 0 | n-C₃H₁   | Н              | Н                | CH₂CN   |
|            | Br             | Н              | CH <sub>3</sub> | 0 | n-C <sub>3</sub> H <sub>7</sub>                | Н              | Н                | CH2CO2C2H5  |
|            | Br             | Н              | CH <sub>3</sub> | 0 | n-C <sub>3</sub> H <sub>7</sub>                | н              | Н                | CH2OCH3   |
|            | Br             | Н              | CH <sub>3</sub> | 0 | n-C₃H₂   | н              | Н                | C <sub>6</sub> H <sub>5</sub>                                 |
| 10         | Br             | Н              | CH₃             | 0 | n-C₃H <sub>7</sub>                             | н              | н                | >-cı  |
|            | Br             | н              | CH₃             | 0 | iso-C₃H <sub>7</sub>                           | н              | н                | CH <sub>3</sub>   |
|            | Br             | Н              | CH <sub>3</sub> | 0 | iso-C₃H₂                                       | Н              | Н                | C₂H₅  |
| 15         | Br             | Н              | CH <sub>3</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н                | n-C <sub>3</sub> H <sub>7</sub>                               |
|            | Br             | Н              | CH <sub>3</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н                | iso-C <sub>3</sub> H <sub>7</sub>                             |
|            | Br             | Н              | CH <sub>3</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н                | n-C₄H₃  |
|            | Br             | Н              | СН₃             | 0 | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н                | iso-C <sub>4</sub> H <sub>9</sub>                             |
|            | Br             | Н              | CH <sub>3</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н                | sec-C <sub>4</sub> H <sub>9</sub>                             |
| 20         | Br             | Н              | CH <sub>3</sub> | 0 | iso-C₃H₁                                       | Н              | Н                | tert-C <sub>4</sub> H <sub>9</sub>                            |
|            | Br             | Н              | CH <sub>3</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н                | (CH₂)₃CI  |
|            | Br             | Н              | CH <sub>3</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н                | (CH₂)₄CI  |
|            | Br             | Н              | CH <sub>3</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н                | CH₂CN   |
| 25         | Br             | Н              | CH <sub>3</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н                | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
| 20         | Br             | Н              | CH <sub>3</sub> | 0 | iso-C₃H <sub>7</sub>                           | Н              | Н                | CH₂OCH₃   |
|            | Br             | Н              | CH <sub>3</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | Н                | C <sub>6</sub> H <sub>5</sub>                                 |
|            | Br             | Н              | CH <sub>3</sub> | 0 | iso-C₃H <sub>7</sub>                           | Н              | н                | -√_>-cı   |
| 30         | Br             | Н              | CH <sub>3</sub> | 0 | CH2OCH3  | н              | Н                | СН₃   |
|            | Br             | Н              | CH <sub>3</sub> | 0 | CH <sub>2</sub> OCH <sub>3</sub>               | Н              | н                | C <sub>6</sub> H <sub>5</sub>                                 |
|            | Br             | Н              | CH <sub>3</sub> | 0 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | н              | Н                | CH <sub>3</sub>   |
|            | Br             | Н              | CH3             | 0 | CH2OC2H5                                       | н              | Н                | C <sub>6</sub> H <sub>5</sub>                                 |
| 05         | Br             | Н              | CH <sub>3</sub> | 1 | Н  | н              | н                | CH <sub>3</sub>   |
| 35         | Br             | Н              | CH <sub>3</sub> | 1 | н  | н              | Н                | C <sub>2</sub> H <sub>5</sub>                                 |
|            | Br             | Н              | CH <sub>3</sub> | 1 | Н  | н              | н                | n-C <sub>3</sub> H <sub>7</sub>                               |
|            | Br             | Н              | CH <sub>3</sub> | 1 | Н  | н              | Н                | iso-C <sub>3</sub> H <sub>7</sub>                             |
|            | Br             | Н              | CH <sub>3</sub> | 1 | Н  | Н              | н                | n-C <sub>4</sub> H <sub>9</sub>                               |
| 40         | Br             | Н              | CH <sub>3</sub> | 1 | Н  | Н              | Н                | iso-C <sub>4</sub> H <sub>9</sub>                             |
|            | Br             | Н              | CH <sub>3</sub> | 1 | Н  | н              | н                | tert-C <sub>4</sub> H <sub>9</sub>                            |
|            | Br             | Н              | CH <sub>3</sub> | 1 | Н  | Н              | н                | (CH₂)₃CI  |
|            | Br             | Н              | CH <sub>3</sub> | 1 | Н  | Н              | Н                | CH₂CN   |
| AE         | Br             | Н              | CH <sub>3</sub> | 1 | Н  | н              | н                | CH₂OCH₃   |
| <b>4</b> 5 | Br             | Н              | CH <sub>3</sub> | 1 | Н  | н              | H                | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|            | Br             | Н              | CH <sub>3</sub> | 1 | Н  | Н              | н                | <b>-</b> ✓  |
| 50         | Br             | н              | CH <sub>3</sub> | 1 | н  | н              | н                | - <del>⟨</del> CH³  |
|            | Br             | н              | CH <sub>3</sub> | 1 | н  | н              | н                | C <sub>6</sub> H <sub>5</sub>                                 |

Table 2 (continued)

|         |                |                |                 |   |                                 |                |                | -   |
|---------|----------------|----------------|-----------------|---|---------------------------------|----------------|----------------|---|
| F       | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>  | n | R <sup>5</sup>                  | R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>  |
| 5       | Br             | Н              | CH <sub>3</sub> | 1 | Н                               | Н              | Н              | (>-cı   |
|         | Br             | н              | CH₃             | 1 | CH <sub>3</sub>                 | н              | н              | CH₃   |
|         | Br             | Н              | CH₃             | 1 | CH <sub>3</sub>                 | Н              | Н              | C₂H₅  |
| 10      | Br             | н              | CH₃             | 1 | CH₃                             | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|         | Br             | Н              | CH <sub>3</sub> | 1 | CH <sub>3</sub>                 | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
|         | Br             | Н              | CH <sub>3</sub> | 1 | CH <sub>3</sub>                 | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|         | Br             | Н              | CH <sub>3</sub> | 1 | CH <sub>3</sub>                 | Н              | Н              | Iso-C <sub>4</sub> H <sub>9</sub>                             |
| ,<br>4E | Br             | Н              | CH <sub>3</sub> | 1 | CH <sub>3</sub>                 | Н              | н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
| 15      | Br             | Н              | CH <sub>3</sub> | 1 | CH <sub>3</sub>                 | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|         | Br             | Н              | CH <sub>3</sub> | 1 | CH <sub>3</sub>                 | Н              | Н              | (CH₂)₃CI  |
|         | Br             | Н              | CH <sub>3</sub> | 1 | CH <sub>3</sub>                 | Н              | Н              | (CH₂)₄CI  |
| -       | Br             | Н              | CH <sub>3</sub> | 1 | CH <sub>3</sub>                 | Н              | Н              | CH₂CN   |
| 20      | Br             | Н              | CH <sub>3</sub> | 1 | CH <sub>3</sub>                 | Н              | Н              | CH <sub>2</sub> OCH₃  |
|         | Br             | Н              | CH <sub>3</sub> | 1 | CH <sub>3</sub>                 | Н              | Н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|         | Br             | Н              | CH₃             | 1 | CH <sub>3</sub>                 | Н              | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
|         | Br             | Н              | CH <sub>3</sub> | 1 | CH <sub>3</sub>                 | Н              | Н              | -√_>-cı   |
| 25      | Br             | н              | CH <sub>3</sub> | 1 | C <sub>2</sub> H <sub>5</sub>   | Н              | н              | CH₃   |
|         | Br             | Н              | CH <sub>3</sub> | 1 | C <sub>2</sub> H <sub>5</sub>   | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                                 |
|         | Br             | Н              | CH <sub>3</sub> | 1 | C <sub>2</sub> H <sub>5</sub>   | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|         | Br             | Н              | CH₃             | 1 | C <sub>2</sub> H <sub>5</sub>   | Н              | Н              | iso-C₃H <sub>7</sub>  |
| 30      | Br             | Н              | CH <sub>3</sub> | 1 | C <sub>2</sub> H <sub>5</sub>   | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|         | Br             | Н              | CH <sub>3</sub> | 1 | C₂Hs                            | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
|         | Br             | Н              | CH₃             | 1 | C <sub>2</sub> H <sub>5</sub>   | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
|         | Br             | Н              | CH₃             | 1 | C₂Hs                            | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
| 35      | Br             | Н              | CH <sub>3</sub> | 1 | C₂H₅                            | Н              | Н              | (CH₂)₃CI  |
| 55      | Br             | Н              | CH₃             | 1 | C₂H <sub>5</sub>                | Н              | Н              | (CH₂)₄CI  |
|         | Br             | Н              | CH₃             | 1 | C₂H₅                            | Н              | н              | CH₂CN   |
|         | Br             | Н              | CH <sub>3</sub> | 1 | C₂H₅                            | Н              | Н              | CH2CO2C2H5  |
|         | Br             | Н              | CH <sub>3</sub> | 1 | C₂H₅                            | Н              | Н              | CH₂OCH₃   |
| 40      | Br             | Н              | CH₃             | 1 | C₂H₅                            | Н              | H              | C <sub>6</sub> H <sub>5</sub>                                 |
|         | Br             | Н              | CH <sub>3</sub> | 1 | C₂Hs                            | Н              | н              | - <b>√_</b> >-CI  |
|         | Br             | Н              | CH₃             | 1 | n-C₃H7                          | Н              | Н              | CH <sub>3</sub>   |
| 45      | Br             | Н              | CH <sub>3</sub> | 1 | n-C₃H7                          | Н              | н              | C <sub>2</sub> H <sub>5</sub>                                 |
| ,,,     | Br             | Н              | CH <sub>3</sub> | 1 | n-C₃H7                          | Н              | Н              | n-C₃H7  |
|         | Br             | Н              | CH₃             | 1 | n-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | iso-C₃H7  |
|         | Br             | Н              | CH <sub>3</sub> | 1 | n-C₃H₁                          | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|         | Br             | Н              | CH <sub>3</sub> | 1 | n-C <sub>3</sub> H <sub>7</sub> | н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
| 50      | Br             | Н              | CH <sub>3</sub> | 1 | n-C₃H7                          | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
|         | Br             | Н              | CH <sub>3</sub> | 1 | n-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|         | Br             | Н              | CH₃             | 1 | n-C₃H₂                          | Н              | Н              | (CH₂)₃CI  |
|         |                |                |                 |   |                                 |                |                |   |

Table 2 (continued)

|    | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>  | n | R <sup>5</sup>                    | R <sup>6</sup> | R <sup>7</sup> | R <sup>8-</sup>   |
|----|----------------|----------------|-----------------|---|-----------------------------------|----------------|----------------|---|
| 5  | Br             | Н              | CH <sub>3</sub> | 1 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | н              | (CH₂)₄CI  |
|    | Br             | Н              | CH <sub>3</sub> | 1 | n-C₃H <sub>7</sub>                | н              | н              | CH₂CN   |
|    | Br             | н              | CH <sub>3</sub> | 1 | n-C₃H7                            | Н              | н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | Br             | н              | CH <sub>3</sub> | 1 | n-C₃H₂                            | Н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>                              |
| 10 | Br             | н              | CH <sub>3</sub> | 1 | n-C <sub>3</sub> H <sub>7</sub>   | н              | н              | C <sub>6</sub> H <sub>5</sub>                                 |
| 10 | Br             | н              | CH <sub>3</sub> | 1 | n-C <sub>3</sub> H <sub>7</sub>   | н              | н              | - <b>C</b> I  |
|    | Br             | Н              | CH <sub>3</sub> | 1 | iso-C₃H₁                          | н              | Н              | CH <sub>3</sub>   |
|    | Br             | Н              | CH <sub>3</sub> | 1 | iso-C₃H₁                          | н              | Н              | C <sub>2</sub> H <sub>5</sub>                                 |
| 15 | Br             | Н              | CH <sub>3</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|    | Br             | н              | CH <sub>3</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
|    | Br             | н              | CH <sub>3</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|    | Br             | Н              | CH <sub>3</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
| 20 | Br             | Н              | CH <sub>3</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
|    | Br             | Н              | CH <sub>3</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | Br             | Н              | CH₃             | 1 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | (CH₂)₃CI  |
|    | Br             | Н              | CH <sub>3</sub> | 1 | iso-C₃H7                          | Н              | Н              | (CH₂)₄CI  |
|    | Br             | Н              | CH₃             | 1 | iso-C₃H <sub>7</sub>              | Н              | Н              | CH₂CN   |
| 25 | Br             | Н              | CH <sub>3</sub> | 1 | iso-C₃H <sub>7</sub>              | н              | Н              | CH₂CO₂C₂H₅  |
|    | Br             | Н              | CH <sub>3</sub> | 1 | iso-C₃H7                          | Н              | н              | CH <sub>2</sub> OCH <sub>3</sub>                              |
|    | Br             | Н              | CH₃             | 1 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
|    | Br             | Н              | CH₃             | 1 | iso-C₃H7                          | н              | Н              | - <b>√_&gt;</b> -cı .   |
| 30 | _              |                |                 | _ |                                   |                |                |   |
|    | Br             | Н              | CH <sub>3</sub> | 2 | Н                                 | н              | Н              | CH₃   |
|    | Br             | Н              | CH <sub>3</sub> | 2 | H                                 | H              | Н              | C₂Hs  |
|    | Br             | Н              | CH <sub>3</sub> | 2 | H                                 | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
| 35 | Br             | Н              | CH <sub>3</sub> | 2 | Н                                 | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
|    | Br             | Н              | CH <sub>3</sub> | 2 | H                                 | H              | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|    | Br             | Н              | CH <sub>3</sub> | 2 | Н                                 | H              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
|    | Br             | Н              | CH <sub>3</sub> | 2 | H                                 | H              | Н              | tert-C₄H₃   |
|    | Br             | Н              | CH <sub>3</sub> | 2 | H                                 | Н              | Н              | (CH₂)₃Cl  |
| 40 | Br             | Н              | CH₃             | 2 | Н                                 | н              | Н              | CH₂CN   |
|    | Br             | Н              | CH₃             | 2 | H                                 | Н              | H              | CH <sub>2</sub> OCH <sub>3</sub>                              |
|    | Br             | Н              | CH₃             | 2 | H                                 | H              | Н              | CH₂CO₂C₂H₅  |
|    | Br             | н              | CH <sub>3</sub> | 2 | Н                                 | н              | Н              | $\overline{}$   |
| 45 | Br             | Н              | CH₃             | 2 | Н                                 | Н              | н              | CH <sub>3</sub>   |
|    | Br             | н              | СН₃             | 2 | Н                                 | Н              | н              | C <sub>6</sub> H <sub>5</sub>                                 |
| 50 | Br             | Н              | CH <sub>3</sub> | 2 | н                                 | н              | Н              |   |
|    | Br             | Н              | CH <sub>3</sub> | 2 | CH <sub>3</sub>                   | н              | н              | CH <sub>3</sub>   |

Table 2 (continued)

| _  | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>  | n | R <sup>5</sup>                  | R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>                     |
|----|----------------|----------------|-----------------|---|---------------------------------|----------------|----------------|------------------------------------|
| 5  | Br             | Н              | CH <sub>3</sub> | 2 | CH <sub>3</sub>                 | Н              | Н              | C₂H <sub>5</sub>                   |
|    | Br             | Н              | CH <sub>3</sub> | 2 | CH <sub>3</sub>                 | Н              | Н              | n-C₃H <sub>7</sub>                 |
|    | Br             | Н              | CH <sub>3</sub> | 2 | CH₃                             | H              | Н              | iso-C₃H7                           |
|    | Br             | Н              | CH <sub>3</sub> | 2 | CH₃                             | Н              | Н              | n-C₄H₃                             |
| 10 | Br             | Н              | CH <sub>3</sub> | 2 | CH <sub>3</sub>                 | Н              | Н              | iso-C₄H₂                           |
|    | Br             | Н              | CH₃             | 2 | CH <sub>3</sub>                 | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>  |
|    | Br             | Н              | CH <sub>3</sub> | 2 | CH <sub>3</sub>                 | Н              | н              | tert-C <sub>4</sub> H <sub>9</sub> |
|    | Br             | Н              | CH <sub>3</sub> | 2 | CH <sub>3</sub>                 | н              | Н              | (CH₂)₃CI                           |
| 15 | Br             | Н              | CH <sub>3</sub> | 2 | CH <sub>3</sub>                 | Н              | Н              | (CH₂)₄CI                           |
| 15 | Br             | Н              | CH <sub>3</sub> | 2 | CH₃                             | Н              | Н              | C <sub>6</sub> H <sub>5</sub>      |
|    | Br             | Н              | CH₃             | 2 | CH <sub>3</sub>                 | Н              | Н              | (_)-cı                             |
| •  | Br             | Н              | CH <sub>3</sub> | 2 | C <sub>2</sub> H <sub>5</sub>   | н              | Н              | CH₃                                |
| 20 | Br             | Н              | CH <sub>3</sub> | 2 | C <sub>2</sub> H <sub>5</sub>   | Н              | н              | C₂H₅                               |
|    | Br             | Н              | CH <sub>3</sub> | 2 | C <sub>2</sub> H <sub>5</sub>   | Н              | Н              | n-C₃H₂                             |
|    | Br             | Н              | CH <sub>3</sub> | 2 | C <sub>2</sub> H <sub>5</sub>   | н              | н              | iso-C₃H7                           |
|    | Br             | Н              | CH <sub>3</sub> | 2 | CH <sub>3</sub>                 | н              | Н              | CH₂CN                              |
| 25 | Br             | Н              | CH <sub>3</sub> | 2 | CH₃                             | Н              | Н              | CH2CO2C2H5                         |
| 20 | Br             | Н              | CH <sub>3</sub> | 2 | CH <sub>3</sub>                 | Н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>   |
|    | 8r             | Н              | CH <sub>3</sub> | 2 | C₂Hs                            | Н              | H              | n-C <sub>4</sub> H <sub>9</sub>    |
|    | Br             | Н              | CH <sub>3</sub> | 2 | C₂H₅                            | Н              | Н              | iso-C₄H₃                           |
|    | Br             | Н              | CH <sub>3</sub> | 2 | C₂H₅                            | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>  |
| 30 | Br             | Н              | CH <sub>3</sub> | 2 | C₂H₅                            | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
|    | Br             | Н              | CH <sub>3</sub> | 2 | C₂Hs                            | Н              | Н              | (CH₂)₃CI                           |
|    | Br             | Н              | CH <sub>3</sub> | 2 | C₂H₅                            | Н              | Н              | (CH₂)₄CI                           |
|    | Br             | Н              | CH₃             | 2 | C₂H₅                            | Н              | Н              | CH₂CN                              |
| 35 | Br             | Н              | CH <sub>3</sub> | 2 | C₂H₅                            | Н              | Н              | CH2CO2C2H5                         |
|    | Br             | Н              | CH <sub>3</sub> | 2 | C₂H₅                            | Н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>   |
|    | Br             | Н              | CH <sub>3</sub> | 2 | C₂H₅                            | н              | Н              | C <sub>6</sub> H <sub>5</sub>      |
|    | Br             | Н              | CH₃             | 2 | C <sub>2</sub> H <sub>5</sub>   | Н              | н              |                                    |
| 40 | Br             | Н              | CH <sub>3</sub> | 2 | n-C <sub>3</sub> H <sub>7</sub> | Н              | H              | CH₃                                |
|    | Br             | Н              | CH <sub>3</sub> | 2 | n-C₃H <sub>7</sub>              | Н              | Н              | C₂H₅                               |
|    | Br             | Н              | CH <sub>3</sub> | 2 | n-C <sub>3</sub> H <sub>7</sub> | н              | н              | n-C <sub>3</sub> H <sub>7</sub>    |
|    | Br             | Н              | CH₃             | 2 | n-C <sub>3</sub> H <sub>7</sub> | Н              | н              | iso-C <sub>3</sub> H <sub>7</sub>  |
| 45 | Br             | Н              | CH <sub>3</sub> | 2 | n-C <sub>3</sub> H <sub>7</sub> | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>    |
|    | Br             | Н              | CH <sub>3</sub> | 2 | n-C <sub>3</sub> H <sub>7</sub> | Н              | H              | iso-C <sub>4</sub> H <sub>9</sub>  |
|    | Br             | Н              | CH <sub>3</sub> | 2 | n-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>  |
|    | Br             | н              | CH <sub>3</sub> | 2 | n-C <sub>3</sub> H <sub>7</sub> | Н              | н              | tert-C <sub>4</sub> H <sub>9</sub> |
|    | Br             | Н              | CH <sub>3</sub> | 2 | n-C₃H <sub>7</sub>              | Н              | Н              | (CH <sub>2</sub> ) <sub>3</sub> CI |
| 50 | Br             | Н              | CH₃             | 2 | n-C <sub>3</sub> H <sub>7</sub> | Н              | • H            | (CH₂)₄CI                           |
|    | Br             | Н              | CH <sub>3</sub> | 2 | n-C <sub>3</sub> H <sub>7</sub> | Н              | н              | CH₂CN                              |
|    | Br             | Н              | CH <sub>3</sub> | 2 | n-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | CH2CO2C2H5                         |

Table 2 (continued)

|    | <u>R</u> 1 | R <sup>2</sup> | R <sup>3</sup>                | n | R <sup>5</sup>                    | R <sup>6</sup> | R <sup>7</sup> | R <sup>8-</sup>                    |
|----|------------|----------------|-------------------------------|---|-----------------------------------|----------------|----------------|------------------------------------|
| 5  | Br         | Н              | CH <sub>3</sub>               | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | CH <sub>2</sub> OCH₃               |
|    | Br         | Н              | CH <sub>3</sub>               | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | C <sub>6</sub> H <sub>5</sub>      |
|    | Br         | н              | СН₃                           | 2 | n-C <sub>3</sub> H <sub>7</sub>   | н              | Н              | — <b>Ç</b> _>—CI                   |
| 10 | Br         | н              | CH <sub>3</sub>               | 2 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | CH <sub>3</sub>                    |
|    | Br         | Н              | CH <sub>3</sub>               | 2 | iso-C₃H <sub>7</sub>              | н              | н              | C₂H₅                               |
|    | Br         | Н              | CH <sub>3</sub>               | 2 | iso-C₃H7                          | н              | н              | n-C <sub>3</sub> H <sub>7</sub>    |
|    | Br         | Н              | CH <sub>3</sub>               | 2 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | iso-C₃H7                           |
|    | Br         | Н              | CH <sub>3</sub>               | 2 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>    |
| 15 | Br         | Н              | CH₃                           | 2 | iso-C₃H7                          | н              | н              | iso-C <sub>4</sub> H <sub>9</sub>  |
|    | Br         | Н              | CH <sub>3</sub>               | 2 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>  |
|    | Br         | Н              | CH₃                           | 2 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | н              | tert-C <sub>4</sub> H <sub>9</sub> |
|    | Br         | Н              | CH <sub>3</sub>               | 2 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | (CH₂)₃CI                           |
| 20 | Br         | Н              | CH <sub>3</sub>               | 2 | iso-C₃H7                          | н              | Н              | (CH <sub>2</sub> ) <sub>4</sub> CI |
|    | Br         | н              | CH <sub>3</sub>               | 2 | iso-C <sub>3</sub> H <sub>7</sub> | н              | н              | CH₂CN                              |
|    | Br         | Н              | CH <sub>3</sub>               | 2 | iso-C₃H <sub>7</sub>              | н              | н              | CH2CO2C2H5                         |
|    | Br         | Н              | CH <sub>3</sub>               | 2 | iso-C <sub>3</sub> H <sub>7</sub> | H              | н              | CH <sub>2</sub> OCH <sub>3</sub>   |
|    | Br         | Н              | CH₃                           | 2 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | C <sub>6</sub> H <sub>5</sub>      |
| 25 | Br         | н              | CH <sub>3</sub>               | 2 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | CI                                 |
|    | Br         | Н              | C₂H₅                          | 0 | н                                 | н              | н              | CH <sub>3</sub>                    |
|    | Br         | Н              | C₂H₅                          | 0 | Н                                 | н              | Н              | C₂Hs                               |
| 30 | Br         | н              | C₂H5                          | 0 | Н                                 | н              | н              | n-C <sub>3</sub> H <sub>7</sub>    |
|    | Br         | н              | C₂H₅                          | 0 | Н                                 | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>  |
|    | Br         | Н              | C₂H₅                          | 0 | Н                                 | н              | н              | n-C <sub>4</sub> H <sub>9</sub>    |
|    | Br         | Н              | C₂H₅                          | 0 | Н                                 | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>  |
| 35 | Br         | Н              | C₂H₅                          | 0 | Н                                 | н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>  |
| 33 | Br         | Н              | C₂H₅                          | 0 | Н                                 | н              | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
|    | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | н                                 | H              | Н              | n-CsH11                            |
|    | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | Н                                 | Н              | н              | n-C <sub>6</sub> H <sub>13</sub>   |
|    | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | Н                                 | Н              | Н              | (CH₂)₄CI                           |
| 40 | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | Н                                 | Н              | Н              | (CH₂)₃CI                           |
|    | Br         | Н              | C₂H5                          | 0 | Н                                 | Н              | Н              | CH₂CN                              |
|    | Br         | H              | C₂H₅                          | 0 | н                                 | н              | Н              | $\overline{}$                      |
| 45 | Br         | Н              | C₂H₅                          | 0 | н                                 | н              | . <b>н</b>     | $\overline{}$                      |
|    | Br         | Н              | C₂H₅                          | 0 | CH <sub>3</sub>                   | н              | Н              | CH <sub>3</sub>                    |
|    | Br         | н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH <sub>3</sub>                   | н              | н              | C₂H₅                               |
| 50 | Br         | н              | C₂H₅                          | 0 | CH <sub>3</sub>                   | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
| 50 | Br         | н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH₃                               | н              | н              | iso-C <sub>3</sub> H <sub>7</sub>  |
|    | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | СНэ                               | н              | H              | n-C <sub>4</sub> H <sub>9</sub>    |

Table 2 (continued)

| 5  | <u>R</u> 1 | R <sup>2</sup> | R <sup>3</sup>                | n | R <sup>5</sup>                  | <br>R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>  |
|----|------------|----------------|-------------------------------|---|---------------------------------|--------------------|----------------|---|
|    | Br         | Н              | C₂H₅                          | 0 | CH <sub>3</sub>                 | Н                  | Н              | iso-C₄H₂  |
|    | 8r         | Н              | C₂H₅                          | 0 | CH₃                             | Н                  | Н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
|    | Br         | Н              | C₂H5                          | 0 | CH <sub>3</sub>                 | Н                  | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH₃                             | Н                  | Н              | (CH₂)₃CI  |
| 10 | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH₃                             | н                  | н              | (CH₂)₄CI  |
|    | Br         | Н              | C₂H₅                          | 0 | CH <sub>3</sub>                 | Н                  | Н              | CH₂CN   |
|    | Br         | Н              | C₂H₅                          | 0 | CH <sub>3</sub>                 | Н                  | Н              | CH2CO2C2H5  |
|    | Br         | Н              | C₂H₅                          | 0 | CH <sub>3</sub>                 | Н                  | Н              | CH₂OCH₃   |
| 15 | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH₃                             | Н                  | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
|    | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH <sub>3</sub>                 | Н                  | н              | - <b>⟨</b> _>-CI  |
|    | Br         | Н              | C₂H5                          | 0 | C <sub>2</sub> H <sub>5</sub>   | Н                  | Н              | CH <sub>3</sub>   |
| -  | Br         | Н              | C₂H5                          | 0 | C <sub>2</sub> H <sub>5</sub>   | Н                  | н              | C₂H₅  |
| 20 | Br         | Н              | C₂H₅                          | 0 | C <sub>2</sub> H <sub>5</sub>   | Н                  | Н              | n-C <sub>2</sub> H <sub>7</sub>                               |
|    | Br         | Н              | C₂H₅                          | 0 | C <sub>2</sub> H <sub>5</sub>   | Н                  | Н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
|    | Br         | Н              | C₂H₅                          | 0 | C <sub>2</sub> H <sub>5</sub>   | н                  | н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|    | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | C <sub>2</sub> H <sub>5</sub>   | Н                  | н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
| 25 | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | C <sub>2</sub> H <sub>5</sub>   | н                  | н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
| 25 | Br         | Н              | C₂H₅                          | 0 | C₂Hs                            | н                  | Н              | tert-C₄H₃   |
|    | Br         | Н              | C₂H₅                          | 0 | C <sub>2</sub> H <sub>5</sub>   | Н                  | н              | (CH <sub>2</sub> ) <sub>3</sub> Cl                            |
|    | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | C <sub>2</sub> H <sub>5</sub>   | Н                  | Н              | (CH₂)₄CI  |
|    | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | C <sub>2</sub> H <sub>5</sub>   | Н                  | н              | CH₂CN   |
| 30 | Br         | Н              | C₂H₅                          | 0 | C₂H₅                            | Н                  | Н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | Br         | Н              | C₂H₅                          | 0 | C₂H₅                            | н                  | . н            | CH <sub>2</sub> OCH <sub>3</sub>                              |
|    | Br         | Н              | C₂Hs                          | 0 | C₂H₅                            | Н                  | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
|    | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | C₂H₅                            | н                  | Н              | ()-cı   |
| 35 | Br         | Н              | C₂H₅                          | 0 | n-C <sub>3</sub> H <sub>7</sub> | Н                  | н              | CH₃   |
|    | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | Ō | n-C <sub>3</sub> H <sub>7</sub> | н                  | н              | C <sub>2</sub> H <sub>5</sub>                                 |
|    | Br         | Н              | C₂H₅                          | Ö | n-C₃H <sub>7</sub>              | н                  | н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|    | Br         | Н              | C₂H₅                          | Ö | n-C <sub>3</sub> H <sub>7</sub> | н                  | н              | iso-C₃H <sub>7</sub>  |
| 40 | Br         | Н              | C₂H₅                          | 0 | n-C <sub>3</sub> H <sub>7</sub> | Н                  | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|    | Br         | н              | C <sub>2</sub> H <sub>5</sub> | 0 | n-C <sub>3</sub> H <sub>7</sub> | н                  | н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
|    | Br         | Н              | C₂H₅                          | 0 | n-C <sub>3</sub> H <sub>7</sub> | Н                  | H              | sec-C <sub>4</sub> H <sub>9</sub>                             |
|    | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | n-C <sub>3</sub> H <sub>7</sub> | <br>Н              | H              | tert-C <sub>4</sub> H <sub>9</sub>                            |
| 45 | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | n-CaH7                          | Н                  | H              | (CH₂)₃CI  |
| 45 | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | Ö | n-CaH7                          | н                  | H              | (CH₂)₄CI  |
|    | Br         | Н              | C₂H₅                          | Ö | n-CaHz                          | н                  | н              | CH₂CN   |
|    | Br         | н              | C <sub>2</sub> H <sub>5</sub> | ō | n-CaH7                          | н                  | н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | Br         | H              | C <sub>2</sub> H <sub>5</sub> | ō | n-C <sub>3</sub> H <sub>7</sub> | н                  | н              | CH <sub>2</sub> OCH <sub>3</sub>                              |
| 50 | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | Ö | n-C <sub>3</sub> H <sub>7</sub> | н                  | н              | C6H5  |
|    | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | n-C <sub>3</sub> H <sub>7</sub> | н                  | н              |   |

Table 2 (continued)

| 5         | R1 | R <sup>2</sup> | R <sup>3</sup>                | n | <b>В</b> 5                        | д <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>  |
|-----------|----|----------------|-------------------------------|---|-----------------------------------|----------------|----------------|---|
| 5         | Br | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | iso-C₃H <sub>7</sub>              | Н              | Н              | CH <sub>3</sub>   |
|           | Br | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | C₂H₅  |
|           | Br | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | iso-C₃H7                          | Н              | Н              | n-C₃H₁  |
|           | Br | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | iso-C <sub>2</sub> H <sub>7</sub> | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
| 10        | Br | Н              | C₂H₅                          | 0 | iso-C₃H₁                          | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|           | Br | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | H              | iso-C <sub>4</sub> H <sub>9</sub>                             |
|           | Br | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
|           | Br | Н              | C₂Hs                          | 0 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
| 15        | Br | Н              | C₂H₅                          | 0 | iso-C₃H <sub>7</sub>              | Н              | Н              | (CH <sub>2</sub> ) <sub>3</sub> Cl                            |
| 70        | Br | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | (CH <sub>2</sub> ) <sub>4</sub> Cl                            |
|           | Br | Н              | C₂H₅                          | 0 | iso-C₃H7                          | Н              | Н              | CH₂CN   |
|           | Br | Н              | C₂H₅                          | 0 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|           | Br | Н              | C₂H₅                          | 0 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>                              |
| 20        | Br | Н              | C₂H₅                          | 0 | iso-C₃H <sub>7</sub>              | Н              | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
|           | Br | Н              | C₂H₅                          | 0 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | \\\CI   |
|           | Br | Н              | C₂H₅                          | 0 | CH <sub>2</sub> OCH <sub>3</sub>  | Н              | Н              | CH <sub>3</sub>   |
| 05        | Br | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH₂SCH₃                           | Н              | Н              | CH <sub>3</sub>   |
| 25        | Br | Н              | C₂H₅                          | 1 | Н                                 | н              | Н              | CH <sub>3</sub>   |
|           | Br | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | Н                                 | Н              | Н              | C₂H₅  |
|           | Br | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | Н                                 | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|           | Br | Н              | C₂H₅                          | 1 | Н                                 | Н              | Н              | n-C₄H₃  |
| 30        | Br | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | Н                                 | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
|           | Br | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | Н                                 | H              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|           | Br | Н              | C₂H₅                          | 1 | Н                                 | Н              | Н              | (CH <sub>2</sub> ) <sub>3</sub> CI                            |
|           | Br | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | Н                                 | Н              | Н              | CH₂CN   |
| <i>35</i> | Br | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | Н                                 | Н              | Н              | CH <sub>2</sub> OCH₃  |
|           | Br | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | Н                                 | Н              | Н              | CH2CO2C2H5  |
|           | Br | Н              | C₂H₅                          | 1 | Н                                 | Н              | Н              | $\overline{}$   |
| 40        | Br | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | Н                                 | н              | Н              | → CH³   |
|           | Br | Н              | C₂H₅                          | 1 | н                                 | Н              | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
|           | Br | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | Н                                 | Н              | Н              | ()-cı   |
| 45        | Br | Н              | C₂H₅                          | 1 | CH <sub>3</sub>                   | н              | н              | СН₃   |
|           | Br | Н              | C₂H₅                          | 1 | CH₃                               | Н              | Н              | C₂H <sub>5</sub>  |
|           | Br | Н              | C₂H₅                          | 1 | CH <sub>3</sub>                   | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|           | Br | Н              | C₂H₅                          | 1 | CH <sub>3</sub>                   | Н              | Н              | iso-C₃H7  |
| 50        | Br | Н              | C₂H₅                          | 1 | CH <sub>3</sub>                   | Н              | Н              | n-C₄H₃  |
|           | Br | Н              | C₂H₅                          | 1 | CH <sub>3</sub>                   | н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
|           | Br | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | CH <sub>3</sub>                   | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>                             |

Table 2 (continued)

|    | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>                | n | R <sup>5</sup>                    | R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>  |
|----|----------------|----------------|-------------------------------|---|-----------------------------------|----------------|----------------|---|
| 5  | Br             | н              | C₂H₅                          | 1 | CH <sub>3</sub>                   | н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | Br             | н              | C <sub>2</sub> H <sub>5</sub> | 1 | CH <sub>3</sub>                   | Н              | Н              | (CH₂)₃CI  |
|    | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | CH <sub>3</sub>                   | н              | Н              | (CH₂)₄CI  |
|    | Br             | Н              | C₂H₅                          | 1 | CH <sub>3</sub>                   | Н              | Н              | CH₂CN   |
| 10 | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | CH₃                               | Н              | Н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | Br             | Н              | C₂H₅                          | 1 | CH <sub>3</sub>                   | Н              | Н              | CH₂OCH₃   |
|    | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | CH <sub>3</sub>                   | Н              | н              | C <sub>6</sub> H <sub>5</sub>                                 |
|    | Br             | Н              | C₂H₅                          | 1 | CH <sub>3</sub>                   | Н              | Н              | CI  |
| 15 | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | C <sub>2</sub> H <sub>5</sub>     | н              | н              | CH <sub>3</sub>   |
|    | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | C <sub>2</sub> H <sub>5</sub>     | н              | Н              | C <sub>2</sub> H <sub>5</sub>                                 |
|    | Br             | Н              | C₂H₅                          | 1 | C <sub>2</sub> H <sub>5</sub>     | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|    | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | C <sub>2</sub> H <sub>5</sub>     | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
| 20 | Br             | Н              | C₂Hs                          | 1 | C <sub>2</sub> H <sub>5</sub>     | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|    | Br             | Н              | C₂H₅                          | 1 | C <sub>2</sub> H <sub>5</sub>     | н              | Н              | iso-C₄H₀  |
|    | Br             | Н              | C₂H₅                          | 1 | C <sub>2</sub> H <sub>5</sub>     | н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
|    | Br             | Н              | C₂Hs                          | 1 | C₂Hs                              | Н              | Н              | tert-C₄H₀   |
|    | Br             | Н              | C₂H₅                          | 1 | C₂Hs                              | Н              | Н              | (CH₂)₃Cl  |
| 25 | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | C₂Hs                              | н              | Н              | (CH₂)₄CI  |
|    | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | C₂H₅                              | н              | Н              | CH₂CN   |
|    | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | C₂H <sub>5</sub>                  | Н              | Н              | CH2CO2C2H5  |
|    | Br             | Н              | C₂H₅                          | 1 | C₂H₅                              | Н              | Н              | CH <sub>2</sub> OCH₃  |
| 30 | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | C₂H <sub>5</sub>                  | Н              | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
|    | Br             | Н              | C₂Hs                          | 1 | C₂H₅                              | н              | Н              | ()-CI   |
|    | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | CH <sub>3</sub>   |
|    | Br             | Н              | C₂H₅                          | 1 | n-C <sub>3</sub> H <sub>7</sub>   | н              | Н              | C₂H₅  |
| 35 | Br             | Н              | C₂H₅                          | 1 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|    | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | n-C₃H7                            | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
|    | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | n-C₃H7                            | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|    | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | n-C <sub>3</sub> H <sub>7</sub>   | н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
| 40 | Br             | Н              | C₂H₅                          | 1 | n-C <sub>3</sub> H <sub>7</sub>   | н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
|    | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | n-C <sub>2</sub> H <sub>7</sub>   | н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | n-C <sub>3</sub> H <sub>7</sub>   | н              | Н              | (CH₂)₃Cl  |
|    | Br             | Н              | C₂H₅                          | 1 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | (CH₂)₄CI  |
|    | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | n-C₃H₂                            | Н              | Н              | CH₂CN   |
| 45 | Br             | Н              | C₂H₅                          | 1 | n-C₃H7                            | н              | Ĥ              | CH2CO2C2H5  |
|    | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | n-C <sub>3</sub> H <sub>7</sub>   | н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>                              |
|    | Br             | Н              | C₂Hs                          | 1 | n-C <sub>3</sub> H <sub>7</sub>   | н              | Н              | CeHs  |
|    | Br             | н              | C₂H₅                          | 1 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | -√_>-cı   |
| 50 | _              |                |                               |   |                                   |                |                |   |
|    | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | iso-C₃H <sub>7</sub>              | н              | Н              | CH <sub>3</sub>   |
|    | Br             | Н              | C₂H₅                          | 1 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | C₂H₅  |

Table 2 (continued)

| F         | <u>R</u> 1 | R <sup>2</sup> | R <sup>3</sup>                | n | R <sup>5</sup>                    | R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>  |
|-----------|------------|----------------|-------------------------------|---|-----------------------------------|----------------|----------------|---|
| 5         | Br         | Н              | C₂H₅                          | 1 | iso-C₃H₁                          | Н              | Н              | n-C₃H <sub>7</sub>  |
|           | Br         | Н              | C₂H₅                          | 1 | iso-C <sub>3</sub> H <sub>7</sub> | H              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
|           | Br         | Н              | C₂H₅                          | 1 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|           | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
| 10        | Br         | Н              | C₂H₅                          | 1 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
|           | Br         | Н              | C₂H₅                          | 1 | iso-C₃H <sub>7</sub>              | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|           | Br         | Н              | C₂Hs                          | 1 | iso-C <sub>3</sub> H <sub>7</sub> | н              | н              | (CH₂)₃Cl  |
|           | Br         | Н              | C₂H <sub>5</sub>              | 1 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | (CH <sub>2</sub> ) <sub>4</sub> Cl                            |
| 15        | Br         | Н              | C₂Hs                          | 1 | iso-C₃H <sub>7</sub>              | Н              | Н              | CH₂CN   |
| 15        | Br         | Н              | C₂Hs                          | 1 | iso-C₃H <sub>7</sub>              | Н              | Н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|           | Br         | Н              | C₂H <sub>5</sub>              | 1 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | CH <sub>2</sub> OCH₃  |
|           | Br         | Н              | C₂Hs                          | 1 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
|           | Br         | Н              | C₂H5                          | 1 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | н              |   |
| 20        |            |                |                               |   |                                   |                |                |   |
|           | Br         | Н              | C₂H₅                          | 2 | Н                                 | Н              | н              | CH <sub>3</sub>   |
|           | Br         | Н              | C₂H5                          | 2 | Н                                 | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                                 |
|           | Br         | Н              | C₂Hs                          | 2 | н                                 | Н              | Н              | n-C₃H <sub>7</sub>  |
| 25        | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | Н                                 | Н              | н              | n-C <sub>4</sub> H <sub>9</sub>                               |
| 23        | Br         | Н              | C₂H5                          | 2 | Н                                 | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
|           | Br         | Н              | C₂H₅                          | 2 | Н                                 | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|           | Br         | Н              | C₂H₅                          | 2 | Н                                 | Н              | Н              | (CH₂)₃Cl  |
|           | Br         | Н              | C₂H₅                          | 2 | Н                                 | Н              | Н              | CH₂CN   |
| 30        | Br         | Н              | C₂H₅                          | 2 | Н                                 | н              | Н              | CH2OCH3   |
|           | Br         | Н              | C₂H₅                          | 2 | Н                                 | Н              | H              | CH2CO2C2H5  |
|           | Br         | Н              | C₂Hs                          | 2 | н                                 | Н              | н              | $\overline{}$   |
| 35        | Br         | н              | C₂H₅                          | 2 | н                                 | н              | н              | ← CH³   |
|           | Br         | Н              | C₂Hs                          | 2 | н                                 | Н              | н              | C <sub>6</sub> H <sub>5</sub>                                 |
|           | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | н                                 | Н              | Н              | (>-cı   |
| 40        | Br         | н              | C₂Hs                          | 2 | CH <sub>3</sub>                   | н              | н              | CH <sub>3</sub>   |
|           | Br         | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | CH <sub>3</sub>                   | Н              | H              |   |
|           | Br         | н              | C <sub>2</sub> H <sub>5</sub> | 2 | CH <sub>3</sub>                   | Н              | Н              | C₂H₅<br>n-C₃H <sub>7</sub>                                    |
|           | Br         | н              | O2H5                          | 2 | CH <sub>3</sub>                   |                |                |   |
| 45        | Br         | H              | C₂Hs                          | 2 | CH <sub>3</sub>                   | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
|           | Br         | н              | C₂Hs<br>C₂Hs                  | 2 | CH <sub>3</sub>                   | H<br>H         | H<br>H         | n-C <sub>4</sub> H <sub>9</sub>                               |
|           | Br         | н              | C2H5                          | 2 | CH <sub>3</sub>                   |                |                | iso-C <sub>4</sub> H <sub>9</sub>                             |
|           | Br         | Н              | C2Hs                          | 2 | CH <sub>3</sub>                   | H<br>H         | Н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
| <b>50</b> | Br         | н              | C <sub>2</sub> H <sub>5</sub> | 2 | CH <sub>3</sub>                   |                | H              | tert-C <sub>4</sub> H <sub>9</sub>                            |
| 50        | Br         | н              | C₂Hs<br>C₂Hs                  | 2 | CH <sub>3</sub>                   | Н              | H              | (CH₂)₃CI  |
|           | Br         | н              | C₂∩s<br>C₂Hs                  | 2 | CH <sub>3</sub>                   | H<br>H         | Н              | (CH₂)₄CI  |
|           | ٠,         |                | U21 15                        | 4 | OFIS                              | п              | Н              | CH₂CN   |

Table 2 (continued)

| 5          | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>                | n | R <sup>5</sup>                    | R <sup>6</sup> | R <sup>7</sup> | $\tilde{R}^B$   |
|------------|----------------|----------------|-------------------------------|---|-----------------------------------|----------------|----------------|---|
| J          | Br             | Н              | C₂H₅                          | 2 | CH <sub>3</sub>                   | н              | Н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|            | Βr             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | CH₃                               | н              | Н              | CH₂OCH₃   |
|            | Br             | Н              | C₂H₅                          | 2 | CH₃                               | H              | H              | C <sub>6</sub> H <sub>5</sub>                                 |
| 10         | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | CH <sub>3</sub>                   | н              | н              | <->-cı  |
| ,,,        | Br             | н              | C <sub>2</sub> H <sub>5</sub> | 2 | C₂H₅                              | н              | Н              | CH₃   |
|            | Br             | Н              | C₂Hs                          | 2 | C <sub>2</sub> H <sub>5</sub>     | н              | Н              | C₁3<br>C₂H₅   |
|            | Br             | н              | C₂H <sub>5</sub>              | 2 | C₂Hs                              | н              | н              | 0-21 15<br>n-C3H7   |
|            | Br             | н              | C₂H₅                          | 2 | C <sub>2</sub> H <sub>5</sub>     | н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
| 15         | Br             | Н              | C₂H₅                          | 2 | C <sub>2</sub> H <sub>5</sub>     | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|            | Br             | Н              | C₂H₅                          | 2 | C <sub>2</sub> H <sub>5</sub>     | H              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
|            | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | C <sub>2</sub> H <sub>5</sub>     | н              | н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
|            | Br             | Н              | C₂H₅                          | 2 | C <sub>2</sub> H <sub>5</sub>     | н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
| 20         | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | C <sub>2</sub> H <sub>5</sub>     | H              | н              | (CH₂)₃CI  |
|            | Br             | н              | C₂H₅                          | 2 | C <sub>2</sub> H <sub>5</sub>     | н              | н              | (CH <sub>2</sub> )₄CI   |
|            | Br             | н              | C₂H₅                          | 2 | C₂H₅                              | н              | н              | CH₂CN   |
|            | Br             | н              | C <sub>2</sub> H <sub>5</sub> | 2 | C <sub>2</sub> H <sub>5</sub>     | н              | н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|            | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | C <sub>2</sub> H <sub>5</sub>     | н              | Н              | CH₂OCH₃   |
| 25         | Br             | Н              | C₂H₅                          | 2 | C <sub>2</sub> H <sub>5</sub>     | н              | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
|            | Br             | Н              | C₂Hs                          | 2 | C₂H₅                              | Н              | Н              | (>-cı   |
|            | Br             | н              | C₂H₅                          | 2 | n-C₃H₂                            | н              | н              | CH₃   |
| 30         | Br             | Н              | C₂H₅                          | 2 | n-C <sub>3</sub> H <sub>7</sub>   | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                                 |
| 50         | Br             | Н              | C₂H₅                          | 2 | n-C₃H₂                            | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|            | Br             | Н              | C₂Hs                          | 2 | n-C₃H₂                            | Н              | н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
|            | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | n-C <sub>3</sub> H <sub>7</sub>   | н              | Н              | n-C₄H₃  |
|            | Br             | Н              | C₂H₅                          | 2 | n-C₃H <sub>7</sub>                | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
| 35         | Br             | Н              | C₂H₅                          | 2 | n-C <sub>3</sub> H <sub>7</sub>   | н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
|            | Br             | Н              | C₂H₅                          | 2 | n-C <sub>2</sub> H <sub>7</sub>   | н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|            | Br             | Н              | ℃₂H₅                          | 2 | n-C <sub>3</sub> H <sub>7</sub>   | н              | Н              | (CH₂)₃CI  |
|            | Br             | Н              | C₂H₅                          | 2 | n-C <sub>3</sub> H <sub>7</sub>   | н              | н              | (CH₂)₄CI  |
| 40         | Br             | Н              | C₂H₅                          | 2 | n-C <sub>3</sub> H <sub>7</sub>   | н              | H              | CH₂CN   |
|            | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | n-C <sub>3</sub> H <sub>7</sub>   | н              | н              | CH2CO2C2H5  |
|            | Br             | Н              | C₂H₅                          | 2 | n-C₃H <sub>7</sub>                | н              | н              | CH₂OCH₃   |
|            | Br             | Н              | C₂Hs                          | 2 | n-C₃H₂                            | н              | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
| <b>4</b> 5 | Br             | Н              | C₂H₅                          | 2 | n-C₃H <sub>7</sub>                | H              | Н              |   |
|            | Br             | Н              | C₂H₅                          | 2 | iso-C <sub>3</sub> H <sub>7</sub> | н              | Ĥ              | СН₃   |
|            | Br             | н              | C₂H₅                          | 2 | iso-C <sub>3</sub> H <sub>7</sub> | Н              | Н              | C₁3<br>C₂H₅   |
|            | Br             | н              | C₂H₅                          | 2 | iso-C₃H <sub>7</sub>              | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
| 50         | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | iso-C₃H <sub>7</sub>              | н              | н              | iso-C₃H <sub>7</sub>  |
| 50         | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | iso-C₃H7                          | н              | H              | n-C <sub>4</sub> H <sub>9</sub>                               |
|            | Br             | Н              | C₂Hs                          | 2 | iso-C₃H7                          | н              | н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
|            |                |                | - · <del>-</del>              | _ |                                   | • •            | ••             |   |

Table 2 (continued)

| _  | R <sup>1</sup> | R <sup>2</sup> | я <sup>3</sup>                  | n | R <sup>5</sup>                    | ₽6 | R <sup>7</sup> | R <sup>8</sup>  |
|----|----------------|----------------|---------------------------------|---|-----------------------------------|----|----------------|---|
| 5  | Br             | Н              | C₂H₅                            | 2 | iso-C₃H7                          | Н  | Н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
|    | Br             | н              | C₂H₅                            | 2 | iso-C₃H₂                          | н  | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | Br             | Н              | C <sub>2</sub> H <sub>5</sub>   | 2 | iso-C <sub>3</sub> H <sub>7</sub> | Н  | н              | (CH₂)₃CI  |
|    | Br             | Н              | C <sub>2</sub> H <sub>5</sub>   | 2 | iso-C <sub>3</sub> H <sub>7</sub> | н  | н              | (CH₂)₄CI  |
| 10 | Br             | Н              | C <sub>2</sub> H <sub>5</sub>   | 2 | iso-C₃H <sub>7</sub>              | Н  | н              | CH₂CN   |
|    | Br             | н              | C <sub>2</sub> H <sub>5</sub>   | 2 | iso-C <sub>3</sub> H <sub>7</sub> | н  | н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | Br             | Н              | C₂H₅                            | 2 | iso-C <sub>3</sub> H <sub>7</sub> | Н  | Н              | CH <sub>2</sub> OCH <sub>3</sub>                              |
|    | Br             | н              | C₂H₅                            | 2 | iso-C₃H <sub>7</sub>              | Н  | н              | C <sub>6</sub> H <sub>5</sub>                                 |
| 15 | Br             | н              | C₂Hs                            | 2 | iso-C₃H7                          | н  | н              |   |
|    | Br             | н              | n-C <sub>3</sub> H <sub>7</sub> | 0 | н                                 | н  | н              | СНэ   |
|    | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub> | 0 | Н                                 | Н  | Н              | C₂H <sub>s</sub>  |
|    | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub> | 0 | Н                                 | Н  | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
| 20 | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub> | 0 | Н                                 | н  | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|    | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub> | 0 | Н                                 | Н  | Н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
|    | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub> | 0 | Н                                 | Н  | н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | Br             | Н              | n-C₃H₁                          | 0 | н                                 | Н  | Н              | (CH <sub>2</sub> ) <sub>3</sub> Cl                            |
|    | Br             | Н              | n-C₃H <sub>7</sub>              | 0 | Н                                 | Н  | Н              | CH₂CN   |
| 25 | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub> | 0 | H                                 | Н  | н              | CH₂OCH₃   |
|    | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub> | 0 | Н                                 | н  | н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | Br             | H              | n-C <sub>3</sub> H <sub>7</sub> | 0 | н                                 | Н  | Н              | <b>-</b> ✓  |
| 30 | Br             | н              | n-C <sub>3</sub> H <sub>7</sub> | 0 | н                                 | н  | Н              | - <del>C</del> H₃   |
|    | Br             | Н              | n-C₃H₁                          | 0 | н                                 | Н  | н              | C <sub>6</sub> H <sub>5</sub>                                 |
|    | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub> | 0 | н                                 | Н  | Н              | -√_>-cı   |
| 35 | Br             | н              | n-C <sub>3</sub> H <sub>7</sub> | 1 | н                                 | н  | u              | CU  |
|    | Br             | н              | n-C <sub>3</sub> H <sub>7</sub> | 1 | Н                                 | Н  | Н              | CH <sub>3</sub><br>C <sub>2</sub> H <sub>5</sub>              |
|    | Br             | н              | n-C <sub>3</sub> H <sub>7</sub> | 1 | н                                 | Н  | H<br>H         | 02∩s<br>n-C₃H₁  |
|    | Br             | н              | n-C₃H7                          | 1 | н                                 | н  | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
| 40 | Br             | н              | n-C <sub>3</sub> H <sub>7</sub> | 1 | H                                 | н  | н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
|    | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub> | 1 | н                                 | H  | н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub> | 1 | н                                 | Н  | н              | (CH <sub>2</sub> ) <sub>3</sub> CI                            |
|    | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub> | 1 | н                                 | н  | H              | CH₂CN   |
| 45 | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub> | 1 | H                                 | H  | н              | CH <sub>2</sub> OCH <sub>3</sub>                              |
| 45 | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub> | 1 | н                                 | Н  | н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | Br             | Н              | n-C₃H₂                          | 1 | Н                                 | н  | н              | — <b>○</b>  |
| 50 | Br             | н              | n-C₃H7                          | 1 | н                                 | н  | н              | - <del>C</del> H₃   |
|    | Br             | н              | n-C₃H₁                          | 1 | н                                 | н  | Н              | C <sub>6</sub> H <sub>5</sub>                                 |

Table 2 (continued)

| 5   | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>                  | n | A <sup>5</sup> | R <sup>6</sup> | R <sup>7</sup> | -R <sup>8</sup>                    |
|-----|----------------|----------------|---------------------------------|---|----------------|----------------|----------------|------------------------------------|
|     | Br             | Н              | n-C₃H <sub>7</sub>              | 1 | Н              | Н              | Н              | \\CI                               |
|     | Br             | H              | n-C₃H₂                          | 2 | Н              | Н              | н              | CH₃                                |
|     | Br             | Н              | n-C₃H₂                          | 2 | Н              | Н              | н              | C₂H₅                               |
| 10  | Br             | Н              | n-C3H7                          | 2 | Н              | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
|     | Br             | Н              | n-C₃H₂                          | 2 | Н              | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>    |
|     | Br             | Н              | n-C₃H <sub>7</sub>              | 2 | Н              | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>  |
|     | Br             | Н              | n-C₃H7                          | 2 | Н              | Н              | н              | tert-C <sub>4</sub> H <sub>9</sub> |
| 15  | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub> | 2 | Н              | Н              | Н              | (CH₂)₃CI                           |
| ,,, | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub> | 2 | Н              | Н              | Н              | CH₂CN                              |
|     | Br             | Н              | n-C₃H <sub>7</sub>              | 2 | H              | Н              | н              | CH₂OCH₃                            |
|     | Br             | Н              | n-C₃H₁                          | 2 | Н              | Н              | Н              | CH2CO2C2H5                         |
|     | Br             | Н              | n-C₃H7                          | 2 | Н              | Н              | н              | $\overline{}$                      |
| 20  |                |                |                                 |   |                |                |                | -                                  |
|     | Br             | Н              | n-C₃H7                          | 2 | H              | Н              | Н              | - <del>⟨</del>                     |
|     | Br             | Н              | n-C <sub>3</sub> H <sub>7</sub> | 2 | н              | н              | н              | C <sub>6</sub> H <sub>5</sub>      |
| 25  | Br             | Н              | n-C₃H <sub>7</sub>              | 2 | Н              | Н              | Н              | ()-cı                              |
|     | Br             | Н              | CHF₂                            | 0 | н              | н              | Н              | CH₃                                |
|     | Br             | Н              | CHF₂                            | 0 | Н              | н              | Н              | C₂H₅                               |
| 30  | Br             | Н              | CHF₂                            | 0 | Н              | н              | Н              | n-C₃H <sub>7</sub>                 |
| 50  | Br             | Н              | CHF₂                            | 0 | Н              | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>    |
|     | Br             | н              | CHF₂                            | 0 | H              | н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>  |
|     | Br             | Н              | CHF₂                            | 0 | Н              | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
|     | Br             | Н              | CHF₂                            | 0 | Н              | Н              | Н              | (CH₂)₃CI                           |
| 35  | Br             | Н              | CHF₂                            | 0 | H              | Н              | н              | CH₂CN                              |
|     | Br             | Н              | CHF <sub>2</sub>                | 0 | Н              | Н              | Н              | CH₂OCH₃                            |
|     | Br             | Н              | CHF <sub>2</sub>                | 0 | Н              | Н              | Н              | CH2CO2C2H5                         |
|     | Br             | Н              | CHF₂                            | 0 | Н              | Н              | Н              | $\overline{}$                      |
| 40  | Br             | н              | CHF2                            | 0 | н              | н              | н              | CH₃<br>→                           |
|     | Br             | н              | CHF₂                            | 0 | н              | н              | н              | C <sub>6</sub> H <sub>5</sub>      |
| 45  | Br             | Н              | CHF₂                            | 0 | н              | Н              | н              | - <del>-</del>                     |
|     | Br             | Н              | CHF₂                            | 1 | н              | н              | н              | CH <sub>3</sub>                    |
|     | Br             | н              | CHF₂                            | 1 | H              | Н              | н              | C₂H₅                               |
|     | Br             | Н              | CHF₂                            | 1 | Н              | н              | H              | n-C <sub>3</sub> H <sub>7</sub>    |
| 50  | Br             | Н              | CHF₂                            | 1 | н              | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>    |
|     | Br             | Н              | CHF₂                            | 1 | н              | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>  |
|     | Br             | Н              | CHF₂                            | 1 | Н              | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
|     |                |                |                                 |   |                |                | •              | · -                                |

Table 2 (continued)

| 5  | <u>R</u> 1 | R <sup>2</sup> | R <sup>3</sup>   | n | R <sup>5</sup> | <br>R <sup>6</sup> | R <sup>7</sup> | R <sup>8-</sup>   |
|----|------------|----------------|------------------|---|----------------|--------------------|----------------|---|
| 5  | Br         | Н              | CHF <sub>2</sub> | 1 | Н              | н                  | Н              | (CH₂)₃CI  |
|    | Br         | Н              | CHF₂             | 1 | Н              | H                  | н              | CH₂CN   |
|    | Br         | Н              | CHF₂             | 1 | Н              | н                  | Н              | CH <sub>2</sub> OCH <sub>3</sub>                              |
|    | Br         | Н              | CHF <sub>2</sub> | 1 | Н              | н                  | н              | CH2CO2C2H5  |
| 10 | Br         | Н              | CHF₂             | 1 | Н              | н                  | Н              | $\overline{}$   |
|    | Br         | н              | CHF₂             | 1 | н              | н                  | н              | <b>⇔</b>  |
| 15 | Br         | Н              | CHF <sub>2</sub> | 1 | Н              | Н                  | н              | C <sub>6</sub> H <sub>5</sub>                                 |
|    | Br         | Н              | CHF₂             | 1 | Н              | Н                  | н              | cı  |
|    | Br         | Н              | CHF₂             | 2 | н              | н                  | н              | CH <sub>3</sub>   |
| 00 | Br         | Н              | CHF₂             | 2 | н              | н                  | н              | C₂H₅  |
| 20 | Br         | Н              | CHF₂             | 2 | н              | н                  | н              | n-C₃H₁  |
|    | Br         | Н              | CHF <sub>2</sub> | 2 | Н              | н                  | н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|    | Br         | н              | CHF₂             | 2 | Н              | Н                  | н              | iso-C <sub>4</sub> H <sub>9</sub>                             |
| •  | Br         | н              | CHF <sub>2</sub> | 2 | Н              | Н                  | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
| 25 | Br         | Н              | CHF <sub>2</sub> | 2 | Н              | н                  | Н              | (CH₂)₃CI  |
|    | Br         | Н              | CHF₂             | 2 | Н              | Н                  | Н              | CH₂CN   |
|    | Br         | Н              | CHF₂             | 2 | Н              | н                  | н              | CH <sub>2</sub> OCH <sub>3</sub>                              |
|    | Br         | Н              | CHF <sub>2</sub> | 2 | Н              | н                  | н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
| 30 | Br         | Н              | CHF₂             | 2 | Н              | н                  | Н              | $\neg \triangleleft$  |
|    | Br         | Н              | CHF₂             | 2 | н              | н                  | н              | ĊH,   |
|    | Br         | Н              | CHF₂             | 2 | н              | н                  | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
| 35 | Br         | Н              | CHF <sub>2</sub> | 2 | н              | н                  | н              | (>-cı   |
|    | Br         | Н              | CF3              | 0 | н              | н                  | н              | C <sub>6</sub> H <sub>5</sub>                                 |
|    | Br         | Н              | CF <sub>3</sub>  | 0 | Н              | н                  | Н              | CH <sub>3</sub>   |
|    | Br         | Н              | CH₂CH₂F          | 0 | Н              | н                  | Н              | СН₃   |
| 40 | Br         | Н              | CH₂CH₂F          | 0 | Н              | н                  | н              | C₂H₅  |
|    | Br         | Н              | CH₂CH₂F          | 0 | Н              | н                  | Н              | n-CaH7  |
|    | Br         | Н              | CH₂CH₂F          | 0 | н              | Н                  | Н              | iso-C₃H7  |
|    | Br         | Н              | CH₂CH₂F          | 0 | Н              | Н                  | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
| 45 | Br         | Н              | CH₂CH₂F          | 0 | Н              | Н                  | Н              | iso-C₄H₃  |
| 45 | Br         | Н              | CH₂CH₂F          | 0 | Н              | н                  | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | Br         | Н              | CH₂CH₂F          | 0 | H              | Н                  | Н              | (CH₂)₃Cl  |
|    | Br         | Н              | CH₂CH₂F          | 0 | н              | Н                  | н              | CH₂CN   |
|    | Br         | Н              | CH₂CH₂F          | 0 | Н              | н                  | Н              | CH <sub>2</sub> OCH <sub>3</sub>                              |
| 50 | Br         | Н              | CH₂CH₂F          | 0 | Ή.             | н                  | н              | CH2CO2C2H5  |
|    | Br         | Н              | CH₂CH₂F          | 0 | Н              | н                  | н              | $\overline{}$   |

EP 0 742 202 A2

Table 2 (continued)

| _  | R <sup>1</sup> | R <sup>2</sup> | A3                                | _n | R <sup>5</sup> | R   | 6 R | 7 R8                          |   |
|----|----------------|----------------|-----------------------------------|----|----------------|-----|-----|-------------------------------|---|
| 5  | Br             | Н              | CH₂CH₂F                           | 0  | Н              | Н   | н   |                               | )<br>기  |
|    | Br             | н              | CH₂CH₂F                           | 0  | н              | н   | н   | C <sub>6</sub> H <sub>5</sub> |   |
|    | Br             | Н              | CH₂CH₂F                           | 0  | н              | н   |     | -(                            |   |
| 10 | Br             | н              | CH₂CH₂F                           | 1  | Н              | н   | н   | CH₃                           |   |
|    | Br             | Н              | CH₂CH₂F                           | 1  | н              | н   |     | C₂H₅                          | i   |
|    | Br             | Н              | CH₂CH₂F                           | 1  | н              | н   |     | n-C <sub>3</sub>              |   |
|    | Br             | Н              | CH <sub>2</sub> CH <sub>2</sub> F | 1  | Н              | н   |     | iso-C                         |   |
| 15 | Br             | Н              | CH₂CH₂F                           | 1  | н              | н   |     |                               |   |
|    | Br             | Н              | CH₂CH₂F                           | 1  | Н              | н   | н   |                               |   |
|    | Br             | Н              | CH₂CH₂F                           | 1  | Н              | н   |     |                               |   |
| -  | Br             | Н              | CH₂CH₂F                           | 1  | Н              | Н   | Н   |                               |   |
| 20 | Br             | Н              | CH₂CH₂F                           | 1  | Н              | н   |     | •                             | •   |
| 20 | Br             | Н              | CH₂CH₂F                           | 1  | Н              | Н   | н   |                               | OCH <sub>3</sub>                              |
|    | Br             | Н              | CH₂CH₂F                           | 1  | Н              | н   | н   |                               | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | Br             | Н              | CH₂CH₂F                           | 1  | Н              | н   | н   |                               | ◁   |
| 25 | Br             | Н              | CH₂CH₂F                           | 1  | н              | н   | н   | 4                             | 대,<br>フ                                       |
|    | Br             | Н              | CH₂CH₂F                           | 1  | Н              | н   | н   | C <sub>6</sub> H <sub>5</sub> | <b>i</b>                                      |
| 30 | Br             | н              | CH₂CH₂F                           | 1  | Н              | Н   | Н   | ~                             | _>_cı   |
|    | Br             | Н              | CH₂CH₂F                           | 2  | Н              | Н   | н   | СН                            |   |
|    | Br             | Н              | CH₂CH₂F                           | 2  | Н              | н   | н   |                               | <b>;</b>                                      |
|    | Br             | Н              | CH₂CH₂F                           | 2  | Н              | Н   | н   |                               |   |
| 35 | Br             | Н              | CH₂CH₂F                           | 2  | Н              | Н   | н   | iso-0                         | CaH7  |
|    | Br             | Н              | CH₂CH₂F                           | 2  | Н              | Н   | Н   | n-C <sub>4</sub>              | H <sub>9</sub>                                |
|    | Br             | Н              | CH₂CH₂F                           | 2  | Н              | Н   | Н   | iso-C                         | C <sub>4</sub> H <sub>9</sub>                 |
|    | Br             | Н              | CH₂CH₂F                           | 2  | Н              | н   | Н   | tert-0                        | C <sub>4</sub> H <sub>9</sub>                 |
|    | Br             | Н              | CH₂CH₂F                           | 2  | Н              | Н   | Н   | (CH;                          | ı)₃Cl   |
| 40 | Br             | Н              | CH₂CH₂F                           | 2  | Н              | Н   | Н   | CH₂€                          | CN  |
|    | Br             | н              | CH₂CH₂F                           | 2  | Н              | Н   | Н   | CH₂4                          | OCH <sub>3</sub>                              |
|    | Br             | Н              | CH₂CH₂F                           | 2  | Н              | . Н | Н   | CH₂                           | CO₂C₂H₅                                       |
|    | Br             | Н              | CH₂CH₂F                           | 2  | Н              | н   | н   |                               | $\triangleleft$                               |
| 45 | Br             | н              | CH₂CH₂F                           | 2  | Н              | н   | н   | 4                             | <b>Э</b> Н,                                   |
|    | Br             | Н              | CH₂CH₂F                           | 2  | Н              | н   | н   | C <sub>6</sub> H <sub>9</sub> | <b>š</b>                                      |
| 50 | Br             | Н              | CH₂CH₂F                           | 2  | н              | Н   |     | -<                            | >_cı  |
|    | Br             | н              | CH₂CHF₂                           | 0  | Н              | н   | н   |                               |   |

Table 2 (continued)

| 5  | <u>н</u> 1 | R <sup>2</sup> | R <sup>3</sup>                   | n | R <sup>5</sup> | <br>R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>                     |
|----|------------|----------------|----------------------------------|---|----------------|--------------------|----------------|------------------------------------|
| 5  | Br         | Н              | CH₂CHF₂                          | 0 | Н              | Н                  | н              | C <sub>2</sub> H <sub>5</sub>      |
|    | Br         | H              | CH₂CHF₂                          | 0 | Н              | н                  | н              | n-C <sub>3</sub> H <sub>7</sub>    |
|    | Br         | Н              | CH₂CHF₂                          | 0 | Н              | Н                  | н              | iso-C <sub>3</sub> H <sub>7</sub>  |
|    | Br         | Н              | CH <sub>2</sub> CHF <sub>2</sub> | 0 | Н              | Н                  | н              | n-C <sub>4</sub> H <sub>9</sub>    |
| 10 | Br         | Н              | CH₂CHF₂                          | 0 | Н              | Н                  | н              | iso-C <sub>4</sub> H <sub>9</sub>  |
|    | Br         | Н              | CH <sub>2</sub> CHF <sub>2</sub> | 0 | Н              | н                  | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
|    | Br         | Н              | CH <sub>2</sub> CHF <sub>2</sub> | 0 | н              | Н                  | Н              | (CH₂)₃CI                           |
|    | Br         | Н              | CH₂CHF₂                          | 0 | H              | Н                  | Н              | CH₂CN .                            |
| 15 | Br         | Н              | CH₂CHF₂                          | 0 | Н              | Н                  | H              | CH <sub>2</sub> OCH <sub>3</sub>   |
| 13 | Br         | Н              | CH <sub>2</sub> CHF <sub>2</sub> | 0 | Н              | Н                  | Н              | CH2CO2C2H5                         |
|    | Br         | Н              | CH₂CHF₂                          | 0 | Н              | Н                  | Н              | $\neg \triangleleft$               |
| 20 | Br         | Н              | CH₂CHF₂                          | 0 | н              | н                  | н              |                                    |
|    | Br         | н              | CH₂CHF₂                          | 0 | н              | Н                  | н              | C <sub>6</sub> H <sub>5</sub>      |
|    | Br         | Н              | CH₂CHF₂                          | 0 | н              | Н                  | Н              | >-cı                               |
| 25 | Br         | Н              | CH₂CHF₂                          | 1 | Н              | н                  | н              | CH <sub>3</sub>                    |
|    | Br         | Н              | CH₂CHF₂                          | 1 | Н              | н                  | н              | C₂H₅                               |
|    | Br         | Н              | CH2CHF2                          | 1 | Н              | Н                  | н              | n-C <sub>3</sub> H <sub>7</sub>    |
|    | Br         | Н              | CH₂CHF₂                          | 1 | Н              | н                  | н              | iso-C₃H7                           |
|    | Br         | Н              | CH₂CHF₂                          | 1 | Н              | Н                  | Н              | n-C₄H₃                             |
| 30 | Br         | Н              | CH₂CHF₂                          | 1 | н              | н                  | н              | iso-C <sub>4</sub> H <sub>9</sub>  |
|    | Br         | Н              | CH₂CHF₂                          | 1 | Н              | Н                  | Н              | tert-C <sub>4</sub> H <sub>9</sub> |
|    | Br         | Н              | CH₂CHF₂                          | 1 | Н              | Н                  | н              | (CH <sub>2</sub> ) <sub>3</sub> Cl |
|    | Br         | Н              | CH <sub>2</sub> CHF <sub>2</sub> | 1 | Н              | н                  | н              | CH₂CN                              |
| 35 | Br         | H              | CH₂CHF₂                          | 1 | Н              | Н                  | н              | CH <sub>2</sub> OCH₃               |
|    | Br         | Н              | CH₂CHF₂                          | 1 | Н              | н                  | н              | CH2CO2C2H5                         |
|    | Br         | Н              | CH₂CHF₂                          | 1 | Н              | Н                  | Н              | $\overline{}$                      |
| 40 | Br         | н              | CH₂CHF₂                          | 1 | н              | н                  | н              | <del>С</del> Н3                    |
|    | Br         | н              | CH₂CHF₂                          | 1 | н              | Н                  | Н              | C <sub>6</sub> H <sub>5</sub>      |
|    | Br         | н              | CH₂CHF₂                          | 1 | Н              | Н                  | Н              | -CI                                |
| 45 | Br         | н              | CH₂CHF₂                          | 2 | н              | н                  | H              | CH <sub>3</sub>                    |
|    | Br         | н              | CH <sub>2</sub> CHF <sub>2</sub> | 2 | н              | Н                  | H              | C₂H₅                               |
|    | Br         | н              | CH <sub>2</sub> CHF <sub>2</sub> | 2 | н              | н                  | н              | n-C₃H <sub>7</sub>                 |
|    | Br         | н              | CH₂CHF₂                          | 2 | н              | Н                  | н              | iso-C <sub>3</sub> H <sub>7</sub>  |
| 50 | Br         | Н              | CH <sub>2</sub> CHF <sub>2</sub> | 2 | н              | H                  | н              | n-C <sub>4</sub> H <sub>9</sub>    |
|    | Br         | Н              | CH <sub>2</sub> CHF <sub>2</sub> | 2 | н              | Н                  | Н              | iso-C <sub>4</sub> H <sub>9</sub>  |
|    | Br         | Н              | CH₂CHF₂                          | 2 | H              | Н                  | н              | tert-C <sub>4</sub> H <sub>9</sub> |

Table 2 (continued)

| E  | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>                   | n | R <sup>5</sup> | R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>  |
|----|----------------|----------------|----------------------------------|---|----------------|----------------|----------------|---|
| 5  | Br             | Н              | CH₂CHF₂                          | 2 | Н              | Н              | Н              | (CH₂)₃CI  |
|    | Br             | Н              | CH₂CHF₂                          | 2 | Н              | Н              | Н              | CH₂CN   |
|    | Br             | Н              | CH₂CHF₂                          | 2 | Н              | Н              | Н              | CH2OCH3   |
|    | Br             | Н              | CH₂CHF₂                          | 2 | Н              | Н              | Н              | CH2CO2C2H5  |
| 10 | Br             | Н              | CH₂CHF₂                          | 2 | н              | н              | Н              | $\overline{}$   |
|    | Br             | н              | CH₂CHF₂                          | 2 | н              | н              | н              | → CH <sub>3</sub>   |
| 15 | Br             | Н              | CH₂CHF₂                          | 2 | Н              | Н              | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
|    | Br             | Н              | CH <sub>2</sub> CHF <sub>2</sub> | 2 | Н              | н              | Н              | - <b>√_</b> >-cı  |
|    | Br             | Н              | CH₂CF₃                           | 0 | н              | Н              | Н              | CH <sub>3</sub>   |
| 20 | Br             | Н              | CH <sub>2</sub> CF <sub>3</sub>  | 0 | Н              | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                                 |
|    | Br             | Н              | CH <sub>2</sub> CF <sub>3</sub>  | 0 | Н              | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|    | Br             | Н              | CH₂CF₃                           | 0 | Н              | Н              | н              | iso-C₃Hr  |
|    | Br             | Н              | CH₂CF₃                           | 0 | Н              | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|    | Br             | Н              | CH₂CF₃                           | 0 | н              | Н              | Н              | iso-C₄H₃  |
| 25 | Br             | Н              | CH₂CF₃                           | 0 | Н              | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | Br             | Н              | CH₂CF₃                           | 0 | Н              | н              | Н              | (CH <sub>2</sub> )₃CI   |
|    | Br             | Н              | CH₂CF₃                           | 0 | Н              | Н              | Н              | CH₂CN   |
|    | Br             | Н              | CH <sub>2</sub> CF <sub>3</sub>  | 0 | Н              | н              | н              | CH <sub>2</sub> OCH <sub>3</sub>                              |
| 30 | Br             | Н              | CH₂CF₃                           | 0 | Н              | Н              | Н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | Br             | Н              | CH₂CF₃                           | 0 | н              | н              | Н              | $\overline{}$   |
| 35 | Br             | н              | CH <sub>2</sub> CF <sub>3</sub>  | 0 | н              | н              | н              | <del>с</del> ң,   |
| 55 | Br             | н              | CH₂CF₃                           | 0 | Н              | н              | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
|    | Br             | н              | CH₂CF₃                           | 0 | Н              | н              | н              | -{-}-cı   |
|    | Br             | н              | CH₂CF₃                           | 1 | н              | н              | н              | CH <sub>3</sub>   |
| 40 | Br             | н              | CH₂CF₃                           | 1 | Н              | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                                 |
|    | Br             | Н              | CH₂CF₃                           | 1 | Н              | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|    | Br             | Н              | CH₂CF₃                           | 1 | Н              | Н              | н              | iso-C <sub>2</sub> H <sub>7</sub>                             |
|    | Br             | Н              | CH₂CF₃                           | 1 | н              | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
| 45 | Br             | Н              | CH <sub>2</sub> CF <sub>3</sub>  | 1 | Н              | Н              | H              | iso-C <sub>4</sub> H <sub>9</sub>                             |
|    | Br             | Н              | CH <sub>2</sub> CF <sub>3</sub>  | 1 | Н              | Н              | Ĥ              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | Br             | Н              | CH <sub>2</sub> CF <sub>3</sub>  | 1 | Н              | н              | Ĥ              | (CH₂)₃Cl  |
|    | Br             | Н              | CH <sub>2</sub> CF <sub>3</sub>  | 1 | Н              | Н              | Н              | CH₂CN   |
|    | Br             | Н              | CH₂CF₃                           | 1 | Н              | Н              | н              | CH₂OCH₃   |
| 50 | Br             | Н              | CH <sub>2</sub> CF <sub>3</sub>  | 1 | Н              | Н              | Н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | Br             | Н              | CH₂CF₃                           | 1 | н              | Н              | Н              | <b>→</b> □  |

Table 2 (continued)

| 5  | R <sup>1</sup> | n <sup>2</sup> | R <sup>3</sup>                  | n | я <sup>5</sup> | R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>                     |
|----|----------------|----------------|---------------------------------|---|----------------|----------------|----------------|------------------------------------|
| -  | Br             | н              | CH₂CF₃                          | 1 | Н              | н              | н              | CH <sub>3</sub>                    |
|    | Br             | Н              | CH <sub>2</sub> CF <sub>3</sub> | 1 | н              | н              | н              | C <sub>6</sub> H <sub>5</sub>      |
| 10 | Br             | Н              | CH₂CF₃                          | 1 | Н              | Н              | Н              | (>-cı                              |
|    | Br             | н              | CH₂CF₃                          | 2 | Н              | Н              | Н              | CH₃                                |
|    | Br             | Н              | CH₂CF₃                          | 2 | Н              | Н              | Н              | C₂H₅                               |
| 45 | Br             | Н              | CH <sub>2</sub> CF <sub>3</sub> | 2 | Н              | Н              | Н              | n-C₃H₁                             |
| 15 | Br             | Н              | CH₂CF₃                          | 2 | Н              | Н              | Н              | iso-C <sub>3</sub> H <sub>7</sub>  |
|    | Br             | Н              | CH <sub>2</sub> CF <sub>3</sub> | 2 | Н              | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>    |
|    | Br             | Н              | CH₂CF₃                          | 2 | Н              | Н              | Н              | iso-C <sub>4</sub> H <sub>9</sub>  |
|    | Br             | Н              | CH₂CF₃                          | 2 | Н              | Н              | Н              | tert-C₄H₀                          |
| 20 | Br             | Н              | CH <sub>2</sub> CF <sub>3</sub> | 2 | н              | Н              | Н              | (CH <sub>2</sub> ) <sub>3</sub> Cl |
|    | Br             | Н              | CH <sub>2</sub> CF <sub>3</sub> | 2 | Н              | Н              | Н              | CH₂CN                              |
|    | Br             | Н              | CH <sub>2</sub> CF <sub>3</sub> | 2 | Н              | Н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>   |
|    | Br             | Η .            | CH <sub>2</sub> CF <sub>3</sub> | 2 | Н              | Н              | Н              | CH2CO2C2H5                         |
| 25 | Br             | Н              | CH₂CF₃                          | 2 | Н              | Н              | н              | $\neg \triangleleft$               |
|    | Br             | н              | CH₂CF₃                          | 2 | н              | н              | н              | - <del>CH³</del>                   |
| 20 | Br             | Н              | CH₂CF₃                          | 2 | Н              | Н              | Н              | C <sub>6</sub> H <sub>5</sub>      |
| 30 | Br             | Н              | CH₂CF₃                          | 2 | H              | Н              | н              | >-CI                               |
|    | 1              | Н              | C <sub>2</sub> H <sub>5</sub>   | 0 | Н              | н              | н              | C <sub>6</sub> H <sub>5</sub>      |
|    | 1              | H              | CH <sub>3</sub>                 | 0 | Н              | Н              | Н              | CH <sub>3</sub>                    |
| 35 | ı              | Н              | CH <sub>3</sub>                 | 0 | Н              | н              | Н              | C <sub>2</sub> H <sub>5</sub>      |
|    | ſ              | Н              | CH <sub>3</sub>                 | 0 | Н              | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>    |
|    | 1              | Н              | CH <sub>3</sub>                 | 0 | н              | н              | Н              | iso-C₃H <sub>7</sub>               |
|    | 1              | Н              | CH <sub>3</sub>                 | 0 | н `            | Н              | н              | n-C <sub>4</sub> H <sub>9</sub>    |
|    | }              | Н              | CH <sub>3</sub>                 | 2 | H              | H              | Н              | C <sub>2</sub> H <sub>5</sub>      |
| 40 | ſ              | Н              | CH₃                             | 1 | Н              | н              | н              | C <sub>2</sub> H <sub>5</sub>      |
|    | CI             | Н              | CH <sub>3</sub>                 | 0 | Н              | Н              | Н              | COCH <sub>3</sub>                  |
|    | CI             | Н              | CH <sub>3</sub>                 | 1 | Н              | н              | Н              | COCH <sub>3</sub>                  |
|    | CI             | Н              | CH <sub>3</sub>                 | 2 | Н              | н              | н              | COCH <sub>3</sub>                  |
| 45 | CI             | Н              | C <sub>2</sub> H <sub>5</sub>   | 0 | Н              | Н              | Н              | COCH <sub>3</sub>                  |
|    | CI             | Н              | CH <sub>3</sub>                 | 0 | H              | н              | н              | CO <sub>2</sub> CH <sub>3</sub>    |
|    | CI             | Н              | CH <sub>3</sub>                 | 1 | Н              | н              | Н              | CO <sub>2</sub> CH <sub>3</sub>    |
|    | CI             | Н              | CH <sub>3</sub>                 | 2 | н              | н              | Н              | CO₂CH₃                             |
| 50 | CI             | Н              | C <sub>2</sub> H <sub>s</sub>   | 0 | Н              | Н              | Н              | CO <sub>2</sub> CH <sub>3</sub>    |
| 50 | CI             | H              | C <sub>2</sub> H <sub>5</sub>   | 1 | Н              | Н              | H              | CO <sub>2</sub> CH <sub>3</sub>    |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub>   | 2 | н              | Н              | н              | CO <sub>2</sub> CH <sub>3</sub>    |

Table 2 (continued)

| 5  | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>                | n | R <sup>5</sup>                                 | R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>  |
|----|----------------|----------------|-------------------------------|---|--|----------------|----------------|---|
|    | CI             | Н              | СН₃                           | 0 | Н  | Н              | Н              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub>                 |
|    | CI             | Н              | CH <sub>3</sub>               | 1 | Н  | Н              | Н              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub>                 |
|    | CI             | Н              | CH <sub>3</sub>               | 2 | Н  | Н              | Н              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub>                 |
|    | CI             | Н              | C₂H₅                          | 0 | Н  | Н              | Н              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub>                 |
| 10 | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | Н  | н              | Н              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub>                 |
|    | CI             | Н              | C₂H₅                          | 2 | Н  | H              | H              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub>                 |
|    | Br             | н              | C <sub>2</sub> H <sub>5</sub> | 0 | Н  | н              | н              | CH <sub>3</sub>   |
| 15 | Br             | н              | C₂H₅                          | 0 | н  | н              | н              | - <del>-</del>  |
|    | Br             | Н              | C₂H₅                          | 0 | н  | н              | Н              | C <sub>6</sub> H <sub>5</sub>                                 |
|    | - Br           | Н              | C₂H₅                          | 0 | Н  | Н              | Н              | CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
| 20 | Br             | Н              | C₂H₅                          | 0 | Н  | н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>                              |
|    | Br             | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | н  | Н              | Н              | $\neg \triangleleft$  |
|    | Br             | н              | C <sub>2</sub> H <sub>5</sub> | 1 | Н  | н.             | н              | iso-C <sub>3</sub> H <sub>7</sub>                             |
| 25 | Br             | н              | C₂H₅                          | 1 | Н  | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
| 25 | Br             | Н              | C₂Hs                          | 2 | н  | н              | Н              | iso-C₃H <sub>7</sub>  |
|    | Br             | н              | C₂Hs                          | 2 | н  | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
|    | Br             | н              | CH₃                           | 1 | н  | н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
|    | Br             | Н              | CH <sub>3</sub>               | 2 | Н  | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>                             |
| 30 | CI             | Н              | C₂H₅                          | 0 | C₂Hs   | н              | н              | <b>→</b>  |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | C <sub>2</sub> H <sub>5</sub>                  | н              | н              | COCH <sub>3</sub>   |
|    | CI             | H              | C₂H₅                          | 0 | C₂Hs   | Н              | Н              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub>                 |
| 35 | CI             | н              | C₂Hs                          | 0 | C₂H₅ .   | н              | н              | CO₂CH₃  |
|    | CI             | . <b>H</b>     | C₂H₅                          | 0 | CH2OC2H5                                       | Н              | н              | C₂H₅  |
|    | CI             | Н              | C₂H₅                          | 0 | CH2OC2H5                                       | Н              | н              | CH₂OCH₃   |
|    | CI             | Н              | C₂H₅                          | 0 | CH₂OC₂H₅                                       | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
| 40 | CI             | Н              | C₂H₅                          | 0 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | н              | Н              | n-C₄H₃  |
| 40 | CI             | Н              | C₂H₅                          | 0 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | CI             | H              | C₂H₅                          | 0 | CH <sub>2</sub> OCH₃                           | Н              | Н              | C₂H₅  |
|    | CI             | Н              | C₂H₅                          | 0 | CH <sub>2</sub> OCH₃                           | Н              | Н              | CH₂OCH₃   |
|    | CI             | Н              | C₂H₅                          | 0 | CH <sub>2</sub> OCH <sub>3</sub>               | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
| 45 | CI             | Н              | C₂H₅                          | 0 | CH <sub>2</sub> OCH <sub>3</sub>               | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                               |
|    | CI             | Н              | C₂H₅                          | 0 | CH₂OCH₃  | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>                            |
|    | CI             | н              | C₂H₅                          | 0 | CH₂SCH₃  | Н              | Н              | C₂H₅  |
|    | CI             | Н              | C₂H₅                          | 0 | CH₂SCH₃  | Н              | н              | CH <sub>2</sub> OCH <sub>3</sub>                              |
| 50 | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH₂SCH₃  | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                               |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH₂SCH₃  | н              | Н              | n-C₄H₃  |
|    | CI             | Н              | C₂H₅                          | 0 | CH₂SCH₃  | Н              | н              | tert-C₄H₃   |

Table 2 (continued)

|    | <u>R</u> 1 | R <sup>2</sup> | R <sup>3</sup>                | _ | R <sup>S</sup>                                 | В <sup>6</sup>                          | В <sup>7</sup> | г <sup>8</sup>                                |
|----|------------|----------------|-------------------------------|---|--|---|----------------|---|
| 5  |            |                |                               | n |  |   |                | <u>n</u>                                      |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH₃  | н                                       | Н              | $\overline{}$                                 |
|    | CI         | н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH <sub>3</sub>                                | н                                       | н              | COCH₃   |
|    | CI         | н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH <sub>3</sub>                                | Н                                       | Н              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
| 10 | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | CH <sub>3</sub>                                | н                                       | н              | CO₂CH₃  |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | COC <sub>2</sub> H <sub>5</sub>                | Н                                       | н              | CH <sub>2</sub> OCH <sub>3</sub>              |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | COC₂H5   | н                                       | Н              | n-CaHz  |
|    | CI         | Н              | C₂H₅                          | 0 | COC₂H₅   | н                                       | н              | n-C <sub>4</sub> H <sub>9</sub>               |
| 15 | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | COC₂H₅   | Н                                       | Н              | tert-C <sub>4</sub> H <sub>9</sub>            |
| 15 | CI         | Н              | C₂H₅                          | 0 | COC <sub>3</sub> H <sub>7</sub> -n             | Н                                       | н              | C₂H₅  |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | COC <sub>3</sub> H <sub>7</sub> -n             | н                                       | Н              | CH <sub>2</sub> OCH <sub>3</sub>              |
|    | CI         | Н              | C₂H₅                          | 0 | COC <sub>3</sub> H <sub>7</sub> -n             | Н                                       | Н              | n-C <sub>3</sub> H <sub>7</sub>               |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | COC₃H₁-n                                       | Н                                       | Н              | n-C <sub>4</sub> H <sub>9</sub>               |
| 20 | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | COC <sub>3</sub> H <sub>7</sub> -n             | н                                       | Н              | tert-C <sub>4</sub> H <sub>9</sub>            |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | COCH <sub>3</sub>                              | н                                       | Н              | C <sub>2</sub> H <sub>5</sub>                 |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | COCH <sub>3</sub>                              | Н                                       | Н              | CH₂OCH₃                                       |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | COCH <sub>3</sub>                              | Н                                       | н              | CH <sub>3</sub>                               |
| 25 | CI         | Н              | C₂H₅                          | 0 | COCH <sub>3</sub>                              | н                                       | Н              | n-C <sub>3</sub> H <sub>7</sub>               |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | COCH3  | Н                                       | н              | n-C4He  |
|    | CI         | Н              | C₂H₅                          | 0 | COCH <sub>3</sub>                              | н                                       | Н              | tert-C <sub>4</sub> H <sub>9</sub>            |
|    | CI         | Н              | C₂H₅                          | 0 | Н  | Н                                       | Н              | (CH₂)₅Br                                      |
|    | CI         | Н              | C₂H₅                          | 0 | Н  | Н                                       | Н              | CH₂CH₂CO₂H                                    |
| 30 | CI         | Н              | C₂H₅                          | 0 | Н  | Н                                       | Н              | CH₂CH₂SCH₃                                    |
|    | Ci         | Н              | C₂H₅                          | 0 | Н  | Н                                       | Н              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | CI         | Н              | C₂H₅                          | 0 | Н  | Н                                       | Н              | CO <sub>2</sub> CH <sub>3</sub>               |
|    | CI         | Н              | C₂H₅                          | 0 | Н  | Н                                       | Н              | COCH <sub>3</sub>                             |
| 35 | CI         | Н              | C₂H₅                          | 0 | iso-C₃H₁                                       | Н                                       | Н              | $\dashv$                                      |
|    | CI         | н              | C₂H₅                          | 0 | iso-C₃H7                                       | н                                       | н              | COCH <sub>3</sub>                             |
|    | CI         | н              | C₂Hs                          | ō | iso-C₃H <sub>7</sub>                           | Н                                       | н              | CO <sub>2</sub> CH <sub>3</sub>               |
|    | CI         | Н              | C₂H₅                          | 0 | n-C <sub>3</sub> H <sub>7</sub>                | Н                                       | Н              | _   |
| 40 |            |                |                               | _ |  | • | ••             | $\neg \triangleleft$                          |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | n-C <sub>3</sub> H <sub>7</sub>                | н                                       | Н              | COCH <sub>3</sub>                             |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 0 | n-C <sub>3</sub> H <sub>7</sub>                | Н                                       | Н              | CO <sub>2</sub> CH <sub>3</sub>               |
|    | CI         | Н              | C₂H₅                          | 1 | C <sub>2</sub> H <sub>5</sub>                  | н                                       | н              | $\rightarrow$                                 |
| 45 | CI         | н              | C₂H₅                          | 1 | C <sub>2</sub> H <sub>5</sub>                  | н                                       | н              | COCH <sub>3</sub>                             |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | C <sub>2</sub> H <sub>5</sub>                  | н                                       | H              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | CI         | Н              | C₂Hs                          | 1 | C <sub>2</sub> H <sub>5</sub>                  | н                                       | Н              | CO <sub>2</sub> CH <sub>3</sub>               |
|    | CI         | Н              | C₂Hs                          | 1 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | н                                       | н              | C <sub>2</sub> H <sub>5</sub>                 |
| 50 | CI         | Н              | C₂Hs                          | 1 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | н                                       | н              | CH <sub>2</sub> OCH <sub>3</sub>              |
| 50 | CI         | Н              | C₂H₅                          | 1 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | H                                       | Н              | CH <sub>3</sub>                               |
|    | CI         | н              | C <sub>2</sub> H <sub>5</sub> | 1 | CH₂OC₂H₅                                       | н                                       | н              | n-C <sub>3</sub> H <sub>7</sub>               |

Table 2 (continued)

|    |            |                |                               |     |  |                |                | -   |
|----|------------|----------------|-------------------------------|-----|--|----------------|----------------|---|
| 5  | <u>B</u> 1 | R <sup>2</sup> | н <sup>3</sup>                | n   | R <sup>5</sup>                                 | R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>                                |
|    | Cl         | Н              | C <sub>2</sub> H <sub>5</sub> | 1   | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>               |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1   | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | н              | н              | tert-C <sub>4</sub> H <sub>9</sub>            |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1   | CH <sub>2</sub> OCH <sub>3</sub>               | н              | Н              | C₂H₅  |
| 10 | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1   | CH <sub>2</sub> OCH₃                           | н              | н              | CH <sub>2</sub> OCH <sub>3</sub>              |
| 10 | CI         | н              | C <sub>2</sub> H <sub>5</sub> | . 1 | CH <sub>2</sub> OCH <sub>3</sub>               | н              | н              | CH₃   |
|    | CI         | Н              | C₂H₅                          | 1   | CH <sub>2</sub> OCH <sub>3</sub>               | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>               |
|    | CI         | Н              | C₂Hs                          | 1   | CH <sub>2</sub> OCH <sub>3</sub>               | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>               |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1   | CH <sub>2</sub> OCH <sub>3</sub>               | н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>            |
| 15 | CI         | Н              | C <sub>2</sub> H <sub>s</sub> | 1   | CH <sub>2</sub> SCH₃                           | н              | Н              | C₂H₅  |
|    | CI         | Н              | C₂H₅                          | 1   | CH₂SCH₃  | Н              | н              | CH <sub>2</sub> OCH <sub>3</sub>              |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1   | CH₂SCH₃  | н              | Н              | CH₃   |
|    | Ct         | Н              | C <sub>2</sub> H <sub>5</sub> | 1   | CH <sub>2</sub> SCH <sub>3</sub>               | Н              | н              | n-C <sub>3</sub> H <sub>7</sub>               |
|    | CI         | Н              | C₂H₅                          | 1   | CH₂SCH₃  | н              | н              | n-C <sub>4</sub> H <sub>9</sub>               |
| 20 | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1   | CH₂SCH₃  | н              | н              | tert-C <sub>4</sub> H <sub>9</sub>            |
|    | CI         | Н              | C₂H₅                          | 1   | CH3  | н              | Н              | $\overline{}$                                 |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1   | CH <sub>3</sub>                                | ·н             | Н              | COCH <sub>3</sub>                             |
| 25 | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1   | CH <sub>3</sub>                                | н              | н              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | CI         | H              | C <sub>2</sub> H <sub>5</sub> | 1   | CH <sub>3</sub>                                | н              | Н              | CO₂CH₃  |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1   | COC₂H <sub>5</sub>                             | н              | н              | C <sub>2</sub> H <sub>5</sub>                 |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1   | COC₂H <sub>5</sub>                             | н              | Н              | CH₂OCH₃                                       |
|    | CI         | Н              | C₂H₅                          | 1   | COC <sub>2</sub> H <sub>5</sub>                | н              | н              | CH₃   |
| 30 | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1   | COC <sub>2</sub> H <sub>5</sub>                | Н :            | н              | n-C <sub>3</sub> H <sub>7</sub>               |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1   | COC₂H₅   | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>               |
|    | CI         | Н              | C₂H₅                          | 1   | COC <sub>2</sub> H <sub>5</sub>                | н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>            |
|    | CI         | H              | C <sub>2</sub> H <sub>5</sub> | 1   | COC <sub>3</sub> H <sub>7</sub> -n             | н              | Н              | C₂Hs  |
| 35 | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1   | COC <sub>3</sub> H <sub>7</sub> -n             | н              | Н              | CH₂OCH₃                                       |
|    | CI         | Н              | C₂H₅                          | 1   | COC <sub>3</sub> H <sub>7</sub> -n             | н              | Н              | CH₃   |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1   | COC <sub>3</sub> H <sub>7</sub> -n             | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>               |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1   | COC <sub>3</sub> H <sub>7</sub> -n             | н              | н              | n-C <sub>4</sub> H <sub>9</sub>               |
|    | CI         | Н              | C₂H₅                          | 1   | COC₃H <sub>7</sub> -n                          | н              | н              | tert-C <sub>4</sub> H <sub>9</sub>            |
| 40 | CI         | Н              | C₂H <sub>5</sub>              | 1   | COCH <sub>3</sub>                              | Н              | Н              | C₂Hs  |
|    | CI         | Н              | C₂H₅                          | 1   | COCH <sub>3</sub>                              | н              | Н              | CH₂OCH₃                                       |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1   | COCH <sub>3</sub>                              | н              | Н              | CH₃   |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1   | COCH <sub>3</sub>                              | н              | Н              | n-C₃H <sub>7</sub>                            |
| 45 | CI         | Н              | C₂H₅                          | 1   | COCH <sub>3</sub>                              | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>               |
|    | CI         | Н              | C₂H <sub>5</sub>              | 1   | COCH₃  | н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>            |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1   | Н  | Н              | Н              | (CH₂)₅Br                                      |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1   | H  | н              | н              | CH₂CH₂CO₂H                                    |
|    | CI         | Н              | C <sub>2</sub> H <sub>5</sub> | 1   | Н  | Н              | Н              | CH₂CH₂SCH₃                                    |
| 50 | CI         | Н              | C₂H₅                          | 1   | Н  | Н              | Н              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | CI         | Н              | C₂H₅                          | 1   | н  | Н              | Н              | CO <sub>2</sub> CH <sub>3</sub>               |
|    | CI         | Н              | C₂H₅                          | 1   | Н  | Н              | Н              | COCH  |
|    |            |                |                               |     |  |                |                |   |

Table 2 (continued)

| _  | R <sup>1</sup> | R <sup>2</sup> | д <sup>3</sup>                | n | R <sup>5</sup>                                 | R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>                                |
|----|----------------|----------------|-------------------------------|---|--|----------------|----------------|---|
| 5  | CI             | Н              | C₂H₅                          | 1 | н  | Н              | Н              | -0  |
|    | CI             | Н              | C₂H₅                          | 1 | Н  | Н              | Н              |   |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | Н  | н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>             |
| 10 | CI             | Н              | C₂H₅                          | 1 | iso-C <sub>3</sub> H <sub>7</sub>              | н              | Н              | $\neg \triangleleft$                          |
|    | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 1 | iso-C₃H <sub>7</sub>                           | Н              | Н              | COCH <sub>3</sub>                             |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | н              | CO <sub>2</sub> CH <sub>3</sub>               |
| 15 | CI             | Н              | C₂H₅                          | 1 | n-C <sub>3</sub> H <sub>7</sub>                | Н              | Н              | $\overline{}$                                 |
|    | CI             | Н              | C₂H₅                          | 1 | n-C <sub>3</sub> H <sub>7</sub>                | Н              | Н              | COCH <sub>3</sub>                             |
|    | CI             | Н              | C₂H₅                          | 1 | n-C <sub>3</sub> H <sub>7</sub>                | н              | Н              | CO <sub>2</sub> CH <sub>3</sub>               |
|    | CI             | Н              | C₂H₅                          | 2 | C₂H₅   | Н              | Н              | $\neg \triangleleft$                          |
| 20 | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | C <sub>2</sub> H <sub>5</sub>                  | н              | Н              | COCH <sub>3</sub>                             |
|    | Cl             | Н              | C₂H₅                          | 2 | C₂H₅   | Н              | н              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | C₂H₅   | н              | Н              | CO <sub>2</sub> CH <sub>3</sub>               |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | н              | C₂Hs  |
| 25 | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>              |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | CH <sub>3</sub>                               |
|    | CI             | Н              | C₂H₅                          | 2 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>               |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | CH <sub>2</sub> OC₂H₅                          | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>               |
|    | CI             | H              | C₂H₅                          | 2 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | tert-C₄He                                     |
| 30 | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | CH₂OCH₃  | Н              | н              | C₂H <sub>5</sub>                              |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | CH <sub>2</sub> OCH <sub>3</sub>               | н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>              |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | CH2OCH3  | н              | н              | CH₃   |
|    | CI             | Н              | C₂Hs                          | 2 | CH <sub>2</sub> OCH <sub>3</sub>               | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>               |
| 35 | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | CH <sub>2</sub> OCH <sub>3</sub>               | Н              | н              | n-C <sub>4</sub> H <sub>9</sub>               |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | CH <sub>2</sub> OCH <sub>3</sub>               | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>            |
| •  | CI             | Н              | C₂H₅                          | 2 | CH₂SCH₃  | Н              | Н              | C₂H₅  |
|    | CI             | Н              | C₂H₅                          | 2 | CH₂SCH₃  | Н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>              |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | CH <sub>2</sub> SCH <sub>3</sub>               | Н              | Н              | CH <sub>3</sub>                               |
| 40 | CI             | Н              | C₂H₅                          | 2 | CH₂SCH₃  | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>               |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | CH₂SCH₃  | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>               |
|    | CI             | Н              | C₂H₅                          | 2 | CH₂SCH₃  | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>            |
|    | CI             | Н              | C₂H₅                          | 2 | CH <sub>3</sub>                                | Н              | Н              | -   |
| 45 | CI             | Н              | C₂Hs                          | 2 | CH <sub>3</sub>                                | н              | Н              | COCH <sub>3</sub>                             |
|    | CI             | Н              | C₂H₅                          | 2 | CH <sub>3</sub>                                | н              | Н              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | CI             | Н              | C₂Hs                          | 2 | CH <sub>3</sub>                                | н              | Н              | CO <sub>2</sub> CH <sub>3</sub>               |
|    | CI             | н              | C <sub>2</sub> H <sub>5</sub> | 2 | COC₂H₅   | н              | Н              | C₂H₅  |
| 50 | CI             | Н              | C₂Hs                          | 2 | COC₂H <sub>5</sub>                             | н              | н              | CH <sub>2</sub> OCH <sub>3</sub>              |
|    | CI             | Н              | C₂Hs                          | 2 | COC <sub>2</sub> H <sub>5</sub>                | Н              | Н              | CH <sub>3</sub>                               |
|    | CI             | Н              | C <sub>2</sub> H <sub>5</sub> | 2 | COC <sub>2</sub> H <sub>5</sub>                | н              | н              | n-C₃H <sub>7</sub>                            |

Table 2 (continued)

| 5  | <u>R<sup>1</sup></u> | R <sup>2</sup> | R <sup>3</sup>                  | n | R <sup>5</sup>                     | R <sup>6</sup> | R <sup>7</sup> | R <sup>B</sup>                                |
|----|----------------------|----------------|---------------------------------|---|------------------------------------|----------------|----------------|---|
| 3  | CI                   | Н              | C <sub>2</sub> H <sub>5</sub>   | 2 | COC <sub>2</sub> H <sub>5</sub>    | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>               |
|    | CI                   | Н              | C <sub>2</sub> H <sub>5</sub>   | 2 | COC₂H <sub>5</sub>                 | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>            |
|    | CI                   | Н              | C₂H₅                            | 2 | COC <sub>3</sub> H <sub>7</sub> -n | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                 |
|    | CI                   | Н              | C₂H₅                            | 2 | COC <sub>3</sub> H <sub>7</sub> -n | Н              | Н              | CH₂OCH₃                                       |
| 10 | CI                   | Н              | C <sub>2</sub> H <sub>5</sub>   | 2 | COC <sub>3</sub> H <sub>7</sub> -n | Н              | Н              | CH <sub>3</sub>                               |
|    | CI                   | Н              | C₂H₅                            | 2 | COC <sub>3</sub> H <sub>7</sub> -n | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>               |
|    | CI                   | Н              | C <sub>2</sub> H <sub>5</sub>   | 2 | COC₃H₂-n                           | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>               |
|    | CI                   | Н              | C <sub>2</sub> H <sub>5</sub>   | 2 | COC <sub>3</sub> H <sub>7</sub> -n | Н              | Н              | tert-C₄H <sub>9</sub>                         |
| 15 | CI                   | Н              | C₂H₅                            | 2 | COCH <sub>3</sub>                  | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                 |
| 10 | CI                   | H              | C₂H₅                            | 2 | COCH <sub>3</sub>                  | Н              | н              | CH2OCH3                                       |
|    | CI                   | Н              | C₂H₅                            | 2 | COCH <sub>3</sub>                  | Н              | н              | CH₃   |
|    | CI                   | Н              | C₂H₅                            | 2 | COCH <sub>3</sub>                  | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>               |
|    | CI                   | Н              | C₂H₅                            | 2 | COCH <sub>3</sub>                  | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>               |
| 20 | CI                   | Н              | C₂H₅                            | 2 | COCH <sub>3</sub>                  | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>            |
|    | CI                   | Н              | C₂H₅                            | 2 | Н                                  | Н              | Н              | (CH₂)₅Br                                      |
|    | CI                   | Н              | C₂H₅                            | 2 | Н                                  | Н              | Н              | CH₂CH₂CO₂H                                    |
|    | CI                   | Н              | C <sub>2</sub> H <sub>5</sub>   | 2 | Н                                  | Н              | Н              | CH₂CH₂SCH₃                                    |
| 25 | CI                   | Н              | C₂H₅                            | 2 | н                                  | Н              | Н              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | CI                   | Н              | C₂H₅                            | 2 | Н                                  | Н              | Н              | CO₂CH₃  |
|    | CI                   | Н              | C <sub>2</sub> H <sub>5</sub>   | 2 | Н                                  | Н              | Н              | COCH <sub>3</sub>                             |
|    | CI                   | Н              | C₂H₅                            | 2 | Н                                  | н              | Н              | $\overline{}$                                 |
| 30 | CI                   | Н              | C <sub>2</sub> H <sub>5</sub>   | 2 | Н                                  | Н              | Н              |   |
|    | CI                   | Н              | C₂H₅                            | 2 | н                                  | н              | н              | sec-C <sub>4</sub> H <sub>9</sub>             |
|    | CI                   | н              | C₂H₅                            | 2 | iso-C₃H7                           | Н              | н              | 4   |
| 35 |                      |                |                                 |   |                                    |                |                | $\rightarrow$                                 |
|    | CI                   | Н              | C₂H₅                            | 2 | iso-C <sub>3</sub> H <sub>7</sub>  | Н              | Н              | COCH₃   |
|    | CI                   | Н              | C <sub>2</sub> H <sub>5</sub>   | 2 | iso-C <sub>3</sub> H <sub>7</sub>  | Н              | Н              | CO <sub>2</sub> CH <sub>3</sub>               |
|    | CI                   | Н              | C₂H₅                            | 2 | n-C <sub>3</sub> H <sub>7</sub>    | Н              | Н              | $\neg \triangleleft$                          |
| 40 | CI                   | Н              | C₂H₅                            | 2 | n-C <sub>3</sub> H <sub>7</sub>    | Н              | Н              | COCH <sub>3</sub>                             |
|    | CI                   | Н              | C₂H₅                            | 2 | n-C <sub>3</sub> H <sub>7</sub>    | Н              | н              | CO <sub>2</sub> CH <sub>3</sub>               |
|    | CI                   | Н              | CH₂CF₃                          | 0 | C <sub>2</sub> H <sub>5</sub>      | н              | Н              | C₂Hs  |
|    | CI                   | Н              | CH <sub>2</sub> CF <sub>3</sub> | 0 | C₂H₅                               | Н              | Н              | CH₂OCH₃                                       |
| 45 | CI                   | Н              | CH <sub>2</sub> CF <sub>3</sub> | 0 | C₂Hs                               | Н              | Н              | CH <sub>3</sub>                               |
| 10 | CI                   | Н              | CH <sub>2</sub> CF <sub>3</sub> | 0 | C₂H₅                               | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>               |
|    | CI                   | Н              | CH₂CF₃                          | 0 | CH₃                                | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                 |
|    | CI                   | Н              | CH₂CF₃                          | 0 | CH <sub>3</sub>                    | Н              | Н              | CH₂OCH₃                                       |
|    | CI                   | Н              | CH₂CF₃                          | 0 | CH₃                                | Н              | Н              | CH <sub>3</sub>                               |
| 50 | CI                   | Н              | CH <sub>2</sub> CF <sub>3</sub> | 0 | CH <sub>3</sub>                    | Н              | Н              | n-C₃H <sub>7</sub>                            |
|    | CI                   | Н              | CH₂CF₃                          | 1 | C₂Hs                               | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                 |
|    | CI                   | Н              | CH₂CF₃                          | 1 | C₂H₅                               | Н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>              |

Table 2 (continued)

| 5   | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>                  | n | R <sup>5</sup>                                 | R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>                                |
|-----|----------------|----------------|---------------------------------|---|--|----------------|----------------|---|
| -   | CI             | Н              | CH₂CF₃                          | 1 | C₂H₅   | Н              | Н              | CH <sub>3</sub>                               |
|     | CI             | Н              | CH₂CF₃                          | 1 | C₂H₅   | Н              | Н              | n-C₃H <sub>7</sub>                            |
|     | CI             | Н              | CH₂CF₃                          | 1 | CH <sub>3</sub>                                | Н              | Н              | C₂H₅  |
|     | CI             | Н              | CH₂CF₃                          | 1 | CH <sub>3</sub>                                | Н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>              |
| 10  | CI             | Н              | CH₂CF₃                          | 1 | CH <sub>3</sub>                                | Н              | Н              | CH <sub>3</sub>                               |
|     | CI             | Н              | CH₂CF₃                          | 1 | CH₃  | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>               |
|     | CI             | Н              | CH <sub>2</sub> CF <sub>3</sub> | 2 | C₂H₅   | Н              | Н              | C₂H₅  |
|     | CI             | Н              | CH <sub>2</sub> CF <sub>3</sub> | 2 | C₂Hs   | Н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>              |
| 15  | CI             | Н              | CH₂CF₃                          | 2 | C₂H <sub>5</sub>                               | Н              | Н              | CH <sub>3</sub>                               |
| ,,, | CI             | Н              | CH₂CF₃                          | 2 | C <sub>2</sub> H <sub>5</sub>                  | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>               |
|     | CI             | Н              | CH₂CF₃                          | 2 | CH₃  | Н              | Н              | C₂H₅  |
|     | CI             | Н              | CH₂CF₃                          | 2 | CH <sub>3</sub>                                | Н              | н              | CH <sub>2</sub> OCH <sub>3</sub>              |
|     | CI             | Н              | CH₂CF₃                          | 2 | CH <sub>3</sub>                                | Н              | Н              | CH₃   |
| 20  | CI             | Н              | CH₂CF₃                          | 2 | CH₃  | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>               |
|     | CI             | Н              | CH <sub>3</sub>                 | 0 | C₂H₅   | Н              | Н              | <b>-</b> <1                                   |
|     |                |                |                                 |   |  |                |                | •   |
|     | CI             | Н              | CH <sub>3</sub>                 | 0 | C₂H₅   | Н              | Н              | COCH <sub>3</sub>                             |
| 25  | CI             | H              | CH <sub>3</sub>                 | 0 | C₂H₅   | Н              | Н              | CO₂C₂H₅                                       |
| 25  | CI             | Н              | CH <sub>3</sub>                 | 0 | C₂H₅   | Н              | Н              | CO <sub>2</sub> CH <sub>3</sub>               |
|     | CI             | Н              | CH <sub>3</sub>                 | 0 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | C₂H₅  |
|     | CI             | Н              | CH <sub>3</sub>                 | 0 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>              |
|     | CI             | Н              | CH <sub>3</sub>                 | 0 | CH2OC2H5                                       | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>               |
| 30  | CI             | Н              | CH <sub>3</sub>                 | 0 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | n-C₄H₃  |
|     | CI             | Н              | CH <sub>3</sub>                 | 0 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>            |
|     | CI             | Н              | CH <sub>3</sub>                 | 0 | CH₂OCH₃  | Н              | Н              | C₂H <sub>5</sub>                              |
|     | CI             | Н              | CH₃                             | 0 | CH₂OCH₃  | Н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>              |
| 35  | CI             | Н              | CH <sub>3</sub>                 | 0 | CH₂OCH₃  | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>               |
| 33  | CI             | Н              | CH <sub>3</sub>                 | 0 | CH₂OCH₃  | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>               |
|     | CI             | Н              | CH <sub>3</sub>                 | 0 | CH₂OCH₃  | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>            |
|     | CI             | Н              | CH <sub>3</sub>                 | 0 | CH₂SCH₃  | Н              | Н              | C₂Hs  |
|     | CI             | Н              | CH <sub>3</sub>                 | 0 | CH₂SCH₃  | Н              | Н              | CH₂OCH₃                                       |
| 40  | CI             | Н              | CH <sub>3</sub>                 | 0 | CH₂SCH₃  | Н              | Н              | n-C₃H <sub>7</sub>                            |
|     | CI             | Н              | CH <sub>3</sub>                 | 0 | CH₂SCH₃  | Н              | Н              | n-C₄H₃  |
|     | CI             | Н              | CH <sub>3</sub>                 | 0 | CH₂SCH₃  | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>            |
|     | CI             | Н              | CH <sub>3</sub>                 | 0 | CH <sub>3</sub>                                | Н              | Н              | $\rightarrow$                                 |
| 45  | CI             | н              | CH <sub>3</sub>                 | 0 | CH <sub>3</sub>                                | н              | н              | COCH <sub>3</sub>                             |
|     | CI             | H              | CH <sub>3</sub>                 | 0 | CH <sub>3</sub>                                | Н              | Н              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|     | CI             | Н              | CH <sub>3</sub>                 | 0 | CH₃  | Н              | Н              | CO₂CH₃  |
|     | CI             | Н              | CH <sub>3</sub>                 | 0 | COC₂H₅   | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                 |
| 50  | CI             | Н              | CH <sub>3</sub>                 | 0 | COC₂H₅   | Н              | н              | CH₂OCH₃                                       |
|     | CI             | Н              | CH <sub>3</sub>                 | 0 | COC₂H <sub>5</sub>                             | H              | н              | n-C <sub>3</sub> H <sub>7</sub>               |
|     | CI             | Н              | CH <sub>3</sub>                 | 0 | COC₂H <sub>5</sub>                             | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>               |
|     |                |                |                                 |   |  |                |                |   |

Table 2 (continued)

|            |            |                |                   |        |  |                |                | <b>-</b>  |
|------------|------------|----------------|-------------------|--------|--|----------------|----------------|---|
| 5          | <u>R</u> 1 | R <sup>2</sup> | R <sup>3</sup>    | n      | R <sup>5</sup>                                 | R <sup>6</sup> | R <sup>7</sup> | R <sup>8</sup>                                  |
|            | CI         | Н              | CH <sub>3</sub>   | 0      | COC₂H₅   | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>              |
|            | CI         | Н              | CH <sub>3</sub>   | 0      | COC <sub>3</sub> H <sub>7</sub> -n             | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                   |
|            | CI         | Н              | CH <sub>3</sub>   | 0      | COC <sub>3</sub> H <sub>7</sub> -n             | Н              | н              | CH₂OCH₃   |
| 10         | CI         | Н              | CH₃               | 0      | COC <sub>3</sub> H <sub>7</sub> -n             | Н              | н              | CH <sub>3</sub>                                 |
| 10         | CI         | Н              | CH <sub>3</sub>   | 0      | COC <sub>3</sub> H <sub>7</sub> -n             | Н              | Н              | n-C₃H₂  |
|            | CI         | Н              | CH₃               | 0      | COC <sub>3</sub> H <sub>7</sub> -n             | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                 |
|            | CI         | Н              | CH₃               | 0      | COC₃H <sub>7</sub> -n                          | Н              | н              | tert-C <sub>4</sub> H <sub>9</sub>              |
|            | CI         | Н              | CH <sub>3</sub>   | 0      | COC <sub>6</sub> H <sub>5</sub>                | Н              | Н              | CH <sub>3</sub>                                 |
| 15         | CI         | Н              | CH₃               | 0      | COCH <sub>3</sub>                              | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                   |
|            | CI         | Н              | CH <sub>3</sub>   | 0      | COCH <sub>3</sub>                              | Н              | Н              | CH₂OCH₃   |
|            | CI         | Н              | CH <sub>3</sub>   | 0      | COCH <sub>3</sub>                              | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                 |
|            | CI         | Н              | CH <sub>3</sub>   | 0      | COCH <sub>3</sub>                              | н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                 |
| 20         | CI         | Н              | CH₃               | . 0    | COCH <sub>3</sub>                              | н              | н              | tert-C <sub>4</sub> H <sub>9</sub>              |
| 20         | CI         | Н              | CH₃               | 0      | Н  | н              | Н              | (CH₂)sBr  |
|            | CI         | Н              | CH <sub>3</sub>   | 0      | Н  | Н              | Н              | CH₂CH₂CO₂H                                      |
|            | CI         | Н              | CH <sub>3</sub>   | 0      | Н  | Н              | Н              | CH₂CH₂SCH₃                                      |
|            | CI         | Н              | CH₃               | 0      | н  | Н              | н              | CH <sub>2</sub> CO <sub>2</sub> CH <sub>3</sub> |
| 25         | CI         | Н              | CH₃               | 0      | Н  | н              | Н              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub>   |
|            | CI         | Н              | CH <sub>3</sub>   | 0      | Н  | Н              | н              | CO₂CH₃  |
|            | CI         | Н              | CH₃               | 0      | н  | Н              | Н              | COCH <sub>3</sub>                               |
|            | CI         | Н              | CH <sub>3</sub>   | 0      | iso-C <sub>3</sub> H <sub>7</sub>              | н              | Н              | $\overline{}$                                   |
| 30         | CI         | н              | СН₃               | •      | ion C I I                                      | • •            |                | •   |
|            | Ci         | Н              | CH <sub>3</sub>   | 0<br>0 | iso-C₃H7<br>iso-C₃H7                           | Н              | Н              | COCH <sub>3</sub>                               |
|            | CI         | н              | CH <sub>3</sub>   | 0      |  | Н              | Н              | CO₂CH₃  |
|            | O.         | • •            | CH3               | U      | n-C₃H <sub>7</sub>                             | Н              | Н              | $\rightarrow$                                   |
| 35         | CI         | Н              | . CH <sub>3</sub> | 0      | n-C <sub>3</sub> H <sub>7</sub>                | н              | н              | COCH <sub>3</sub>                               |
| 35         | CI         | Н              | CH <sub>3</sub>   | 0      | n-C <sub>3</sub> H <sub>7</sub>                | Н              | Н              | CO <sub>2</sub> CH <sub>3</sub>                 |
|            | CI         | Н              | CH <sub>3</sub>   | 1      | C₂H₅   | н              | Н              | 1   |
|            |            |                |                   |        |  |                | ••             | ~   |
|            | CI         | Н              | CH <sub>3</sub>   | 1      | C₂H₅   | Н              | Н              | COCH <sub>3</sub>                               |
| 40         | CI         | Н              | CH₃               | 1      | C₂Hs   | н              | н              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub>   |
|            | CI         | Н              | CH₃               | 1      | C₂H₅   | н              | н              | CO <sub>2</sub> CH <sub>3</sub>                 |
|            | CI         | Н              | CH <sub>3</sub>   | 1      | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | н              | C₂H₅  |
|            | CI         | Н              | CH <sub>3</sub>   | 1      | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>                |
| <b>4</b> 5 | CI         | Н              | CH <sub>3</sub>   | 1      | CH2OC2H5                                       | н              | н              | CH₃   |
|            | CI         | Н              | CH <sub>3</sub>   | 1      | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                 |
|            | CI         | Н              | CH <sub>3</sub>   | 1      | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | н              | n-C₄H₃  |
|            | CI         | Н              | CH <sub>3</sub>   | 1      | CH2OC2H5                                       | н              | Н              | tert-C₄H₀                                       |
|            | CI         | Н              | CH <sub>3</sub>   | 1      | CH <sub>2</sub> OCH <sub>3</sub>               | Н              | Н              | C₂H <sub>s</sub>                                |
| 50         | CI         | Н              | CH <sub>3</sub>   | 1      | CH <sub>2</sub> OCH <sub>3</sub>               | Н              | Н              | CH₂OCH₃   |
|            | CI         | Н              | CH <sub>3</sub>   | 1      | CH₂OCH₃  | Н              | Н              | CH <sub>3</sub>                                 |
|            | CI         | Н              | CH <sub>3</sub>   | 1      | CH₂OCH₃  | Н              | Н              | n-C₃H₁  |

Table 2 (continued)

| _  | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>  | n | R <sup>5</sup>                     | R <sup>6</sup> | R <sup>7</sup> | R <sup>8-</sup>                                 |
|----|----------------|----------------|-----------------|---|------------------------------------|----------------|----------------|---|
| 5  | CI             | Н              | CH <sub>3</sub> | 1 | CH <sub>2</sub> OCH <sub>3</sub>   | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                 |
|    | CI             | Н              | CH <sub>3</sub> | 1 | CH₂OCH₃                            | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>              |
|    | CI             | Н              | CH₃             | 1 | CH₂SCH₃                            | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                   |
|    | CI             | Н              | CH <sub>3</sub> | 1 | CH₂SCH₃                            | Н              | н              | CH₂OCH₃   |
| 10 | CI             | Н              | CH₃             | 1 | CH₂SCH₃                            | н              | Н              | CH <sub>3</sub>                                 |
|    | CI             | Н              | CH₃             | 1 | CH₂SCH₃                            | н              | н              | n-C <sub>3</sub> H <sub>7</sub>                 |
|    | CI             | Н              | CH₃             | 1 | CH <sub>2</sub> SCH₃               | Н              | н              | n-C <sub>4</sub> H <sub>9</sub>                 |
|    | CI             | Н              | CH <sub>3</sub> | 1 | CH₂SCH₃                            | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>              |
| 15 | CI             | Н              | CH <sub>3</sub> | 1 | CH <sub>3</sub>                    | Н              | н              | $\neg \triangleleft$                            |
|    | CI             | Н              | CH <sub>3</sub> | 1 | CH <sub>3</sub>                    | Н              | н              | COCH <sub>3</sub>                               |
|    | CI             | Н              | CH₃             | 1 | CH <sub>3</sub>                    | н              | н              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub>   |
|    | CI             | Н              | CH <sub>3</sub> | 1 | CH <sub>3</sub>                    | Н              | Н              | CO₂CH₃  |
| 20 | CI             | Н              | CH <sub>3</sub> | 1 | COC₂H₅                             | н              | н              | C₂H₅  |
|    | CI             | Н              | CH₃             | 1 | COC₂Hs                             | Н              | н              | CH₂OCH₃   |
|    | CI             | Н              | CH <sub>3</sub> | 1 | COC₂H₅                             | Н              | Н              | CH <sub>3</sub>                                 |
|    | CI             | Н              | CH₃             | 1 | COC₂H <sub>5</sub>                 | н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                 |
|    | CI             | Н              | CH <sub>3</sub> | 1 | COC₂H <sub>5</sub>                 | Н              | ,H             | n-C <sub>4</sub> H <sub>9</sub>                 |
| 25 | CI             | Н              | CH <sub>2</sub> | 1 | COC₂H₅                             | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>              |
|    | CI             | Н              | CH <sub>3</sub> | 1 | COC <sub>3</sub> H <sub>7</sub> -n | Н              | H              | C <sub>2</sub> H <sub>5</sub>                   |
|    | CI             | Н              | CH₃             | 1 | COC₃H <sub>7</sub> -n              | Н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>                |
|    | CI             | Н              | CH₃             | 1 | COC₃H <sub>7</sub> -n              | Н              | Н              | CH <sub>3</sub>                                 |
| 30 | Cl             | Н              | CH <sub>2</sub> | 1 | COC₃H <sub>7</sub> -n              | Н              | Н              | n-C₃H <sub>7</sub>                              |
|    | CI             | Н              | CH <sub>3</sub> | 1 | COC₃H₂-n                           | Н              | н              | n-C₄H•  |
|    | CI             | Н              | CH₃             | 1 | COC <sub>3</sub> H <sub>7</sub> -n | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>              |
|    | CI             | H              | CH <sub>3</sub> | 1 | COCH <sub>3</sub>                  | н              | Н              | C <sub>2</sub> H <sub>5</sub>                   |
| 35 | CI             | Н              | CH <sub>3</sub> | 1 | COCH <sub>3</sub>                  | Н              | Н              | CH₂OCH₃   |
| 33 | CI             | Н              | CH3             | 1 | COCH <sub>3</sub>                  | Н              | Н              | CH <sub>3</sub>                                 |
|    | CI             | Н              | CH <sub>3</sub> | 1 | COCH <sub>3</sub>                  | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>                 |
|    | CI             | Н              | CH <sub>3</sub> | 1 | COCH <sub>3</sub>                  | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>                 |
|    | CI             | H              | CH <sub>3</sub> | 1 | COCH <sub>3</sub>                  | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>              |
| 40 | CI             | Н              | CH <sub>3</sub> | 1 | Н                                  | Н              | Н              | (CH₂)₅Br  |
|    | CI             | Н              | CH₃             | 1 | Н                                  | Н              | Н              | CH₂CH₂CO₂H                                      |
|    | CI             | Н              | CH <sub>3</sub> | 1 | Н                                  | Н              | Н              | CH₂CH₂SCH₃                                      |
|    | CI             | Н              | CH <sub>3</sub> | 1 | Н                                  | Н              | Н              | CH <sub>2</sub> CO <sub>2</sub> CH <sub>3</sub> |
| 45 | Cł             | Н              | CH <sub>3</sub> | 1 | Н                                  | Н              | Н              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub>   |
|    | CI             | Н              | CH <sub>3</sub> | 1 | Н                                  | Н              | H              | CO₂CH₃  |
|    | CI             | Н              | CH <sub>3</sub> | 1 | Н                                  | Н              | Ĥ              | COCH <sub>3</sub>                               |
|    | CI             | Н              | СН₃             | 1 | Н                                  | Н              | Н ,            | $\overline{}$                                   |
| 50 | CI             | н              | CH <sub>3</sub> | 1 | Н                                  | н              | н              | <b>-</b> <>                                     |
|    | CI             | Н              | CH <sub>3</sub> | 1 | Н                                  | Н              | Н              | sec-C <sub>4</sub> H <sub>9</sub>               |

Table 2 (continued)

| 5  | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>  | n | R <sup>5</sup>                                 | я <sup>6</sup> | R <sup>7</sup> | -<br>Я <sup>8</sup>                           |
|----|----------------|----------------|-----------------|---|--|----------------|----------------|---|
|    | CI             | Н              | CH <sub>3</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub>              | Н              | н              | $\rightarrow$                                 |
|    | CI             | Н              | CH <sub>3</sub> | 1 | iso-C₃H <sub>7</sub>                           | Н              | Н              | COCH <sub>3</sub>                             |
| 40 | CI             | Н              | CH <sub>3</sub> | 1 | iso-C <sub>3</sub> H <sub>7</sub>              | н              | Н              | CO₂CH₃  |
| 10 | CI             | н              | СН₃             | 1 | n-C <sub>3</sub> H <sub>7</sub>                | Н              | Н              | $\rightarrow$                                 |
|    | CI             | Н              | CH <sub>3</sub> | 1 | n-C <sub>3</sub> H <sub>7</sub>                | Н              | н              | COCH₃   |
|    | CI             | Н              | CH <sub>3</sub> | 1 | n-C <sub>3</sub> H <sub>7</sub>                | Н              | Н              | CO₂CH₃  |
| 15 | Cl             | н              | CH <sub>3</sub> | 2 | C <sub>2</sub> H <sub>5</sub>                  | Н              | Н              | $\rightarrow$                                 |
|    | CI             | Н              | CH <sub>3</sub> | 2 | C <sub>2</sub> H <sub>5</sub>                  | Н              | н              | COCH <sub>3</sub>                             |
|    | CI             | Н              | CH₃             | 2 | C <sub>2</sub> H <sub>5</sub>                  | Н              | Н              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | CI             | Н              | CH <sub>3</sub> | 2 | C <sub>2</sub> H <sub>5</sub>                  | Н              | Н              | CO₂CH₃  |
| 20 | CI             | Н              | CH <sub>3</sub> | 2 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | н              | н              | C₂H́s   |
|    | CI             | Н              | CH <sub>3</sub> | 2 | CH2OC2H5                                       | Н              | Н              | CH₂OCH₃                                       |
|    | CI             | Н              | CH <sub>3</sub> | 2 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | CH <sub>3</sub>                               |
|    | CI             | H              | CH <sub>3</sub> | 2 | CH2OC2H5                                       | Н              | Н              | n-C₃H <sub>7</sub>                            |
| 05 | Ci             | Н              | CH <sub>3</sub> | 2 | CH₂OC₂H₅                                       | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>               |
| 25 | CI             | Н              | CH <sub>3</sub> | 2 | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>            |
|    | CI             | Н              | CH <sub>3</sub> | 2 | CH <sub>2</sub> OCH <sub>3</sub>               | н              | н              | C₂H₅  |
|    | CI             | Н              | CH <sub>3</sub> | 2 | CH₂OCH₃  | Н              | Н              | CH <sub>2</sub> OCH <sub>3</sub>              |
|    | CI             | Н              | CH <sub>3</sub> | 2 | CH₂OCH₃  | н              | Н              | CH₃   |
| 30 | CI             | Н              | CH <sub>3</sub> | 2 | CH2OCH3  | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>               |
|    | CI             | Н              | CH <sub>3</sub> | 2 | CH <sub>2</sub> OCH <sub>3</sub>               | Н              | н              | n-C₄H <sub>9</sub>                            |
|    | CI             | Н              | CH <sub>3</sub> | 2 | CH₂OCH₃  | Н              | Н              | tert-C <sub>4</sub> H <sub>9</sub>            |
|    | CI             | Н              | CH <sub>3</sub> | 2 | CH₂SCH₃  | Н              | Н              | C₂Hs  |
| 25 | CI             | Н              | CH <sub>3</sub> | 2 | CH₂SCH₃  | Н              | н              | CH <sub>2</sub> OCH <sub>3</sub>              |
| 35 | CI             | Н              | CH <sub>2</sub> | 2 | CH₂SCH₃  | Н              | н              | CH₃   |
|    | CI             | Н              | CH₃             | 2 | CH₂SCH₃  | Н              | н              | n-C <sub>3</sub> H <sub>7</sub>               |
|    | CI             | Н              | CH <sub>3</sub> | 2 | CH₂SCH₃  | Н              | Н              | n-C₄H₃  |
|    | CI             | Н              | CH₃             | 2 | CH₂SCH₃  | н              | н              | tert-C <sub>4</sub> H <sub>9</sub>            |
| 40 | CI             | Н              | CH <sub>3</sub> | 2 | CH <sub>3</sub>                                | н              | Н              | $\neg$  |
|    | CI             | Н              | CH₃             | 2 | CH <sub>3</sub>                                | н              | Н              | COCH <sub>3</sub>                             |
|    | CI             | Н              | CH <sub>3</sub> | 2 | CH <sub>3</sub>                                | Н              | Н              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | CI             | Н              | CH <sub>3</sub> | 2 | CH₃  | H ·            | Н              | CO <sub>2</sub> CH <sub>3</sub>               |
| 45 | CI             | Н              | CH <sub>3</sub> | 2 | COC₂H₅   | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                 |
|    | CI             | Н              | CH <sub>3</sub> | 2 | COC₂H₅   | Н              | н              | CH <sub>2</sub> OCH <sub>3</sub>              |
|    | CI             | Н              | CH <sub>3</sub> | 2 | COC <sub>2</sub> H <sub>5</sub>                | Н              | Н              | CH <sub>3</sub>                               |
|    | CI             | Н              | CH <sub>3</sub> | 2 | COC₂H <sub>5</sub>                             | Н              | Н              | n-C <sub>3</sub> H <sub>7</sub>               |
| 50 | CI             | Н              | CH <sub>3</sub> | 2 | COC₂H <sub>5</sub>                             | Н              | Н              | n-C <sub>4</sub> H <sub>9</sub>               |
|    | CI             | Н              | CH <sub>3</sub> | 2 | COC₂H <sub>5</sub>                             | Н              | н              | tert-C <sub>4</sub> H <sub>9</sub>            |
|    | CI             | н              | CH <sub>3</sub> | 2 | COC <sub>3</sub> H <sub>7</sub> -n             | Н              | Н              | C <sub>2</sub> H <sub>5</sub>                 |

Table 2 (continued)

| 5  | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>  | n | R <sup>5</sup>                     | R <sup>6</sup> | _ R <sup>7</sup> | R <sup>8</sup>                                |
|----|----------------|----------------|-----------------|---|------------------------------------|----------------|------------------|---|
| •  | CI             | Н              | CH <sub>3</sub> | 2 | COC <sub>3</sub> H <sub>7</sub> -n | Н              | Н                | CH₂OCH₃                                       |
|    | CI             | Н              | CH₃             | 2 | COC₃H₁-n                           | Н              | Н                | CH₃   |
|    | CI             | Н              | CH <sub>3</sub> | 2 | COC₃H <sub>7</sub> -n              | Н              | Н                | n-C₃H <sub>7</sub>                            |
| 40 | CI             | Н              | CH <sub>3</sub> | 2 | COC₃H <sub>7</sub> -n              | Н              | Н                | n-C <sub>4</sub> H <sub>9</sub>               |
| 10 | CI             | Н              | CH <sub>3</sub> | 2 | COC₃H <sub>7</sub> -n              | Н              | Н                | tert-C <sub>4</sub> H <sub>9</sub>            |
|    | CI             | Н              | CH <sub>3</sub> | 2 | COCH <sub>3</sub>                  | н              | Н                | C <sub>2</sub> H <sub>5</sub>                 |
|    | CI             | Н              | CH <sub>3</sub> | 2 | COCH3                              | Н              | Н                | CH <sub>2</sub> OCH <sub>3</sub>              |
| •  | CI             | Н              | CH₃             | 2 | COCH <sub>3</sub>                  | Н              | н                | CH <sub>3</sub>                               |
| 15 | CI             | Н              | CH <sub>3</sub> | 2 | COCH <sub>3</sub>                  | н              | н                | n-C₃H <sub>7</sub>                            |
|    | CI             | Н              | CH <sub>3</sub> | 2 | COCH <sub>3</sub>                  | Н              | Н                | n-C <sub>4</sub> H <sub>9</sub>               |
|    | CI             | Н              | CH₃             | 2 | COCH <sub>3</sub>                  | Н              | Н                | tert-C <sub>4</sub> H <sub>9</sub>            |
|    | CI ·           | Н              | CH₃             | 2 | Н                                  | Н              | Н                | (CH <sub>2</sub> ) <sub>5</sub> Br            |
| 20 | CI             | Н              | CH <sub>3</sub> | 2 | Н                                  | Н              | Н                | CH₂CH₂CO₂H                                    |
|    | CI             | Н              | CH <sub>3</sub> | 2 | Н                                  | Н              | н                | CH₂CH₂SCH₃                                    |
|    | CI             | Н              | CH₃             | 2 | Н                                  | Н              | Н                | CH₂CO₂CH₃                                     |
|    | CI             | Н              | CH <sub>3</sub> | 2 | Н                                  | н              | Н                | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
| 25 | CI             | Н              | CH₃             | 2 | Н                                  | Н              | н                | CO₂CH₃  |
|    | CI             | Н              | CH₃             | 2 | Н                                  | Н              | Н                | COCH <sub>3</sub>                             |
|    | Cl             | Н              | CH <sub>3</sub> | 2 | Н                                  | н              | Н                | $\overline{}$                                 |
| 30 | CI             | Н              | CH <sub>3</sub> | 2 | Н                                  | Н              | Н                |   |
|    | CI             | Н              | CH <sub>3</sub> | 2 | Н                                  | Н              | н                | sec-C <sub>4</sub> H <sub>9</sub>             |
|    | CI             | Н              | CH <sub>3</sub> | 2 | iso-C₃H7                           | Н              | Н                | $\overline{}$                                 |
| 35 | CI             | Н              | CH <sub>3</sub> | 2 | iso-C₃H <sub>7</sub>               | Н              | Н                | COCH <sub>3</sub>                             |
|    | CI             | Н              | CH <sub>3</sub> | 2 | iso-C₃H7                           | н              | н                | CO <sub>2</sub> CH <sub>3</sub>               |
|    | CI             | Н              | CH3             | 2 | n-C₃H <sub>7</sub>                 | н              | Н                | $\overline{}$                                 |
|    | CI             | Н              | CH₃             | 2 | n-C <sub>3</sub> H <sub>7</sub>    | н              | н                | COCH <sub>3</sub>                             |
| 40 | CI             | Н              | CH <sub>3</sub> | 2 | n-C₃H <sub>7</sub>                 | Н              | Н                | CO <sub>2</sub> CH <sub>3</sub>               |

Table 3

5

10

 $R^1$   $R^2$  $R^3$ R<sup>4</sup> R<sup>5</sup> R<sup>6</sup> R<sup>7</sup> 15 Br Н C<sub>2</sub>H<sub>5</sub> 0 Н Н Н Н Br Н C<sub>2</sub>H<sub>5</sub> 0 tert-C<sub>4</sub>H<sub>9</sub> Н Н н Br H  $C_2H_5$ 2 Н н Н Н Br Н  $C_2H_5$ 1 Н Н Н Н 20 Br H CH<sub>3</sub> 0 Н н Н Н Br Н CH<sub>3</sub> 0 tert-C<sub>4</sub>H<sub>9</sub> Н Н Н Br Н CH<sub>3</sub> 2 Н Н н Н Br Н CH<sub>3</sub> 2 CH<sub>3</sub> CH<sub>3</sub> Н Н 25 Br H CH<sub>3</sub> 2 CH<sub>3</sub> Н Н Н Br H CH<sub>3</sub> 2  $C_6H_5$ H -Н Н Br H CH<sub>3</sub> 2 Н Н Н 30 Br H CH<sub>3</sub> 1 Н Н Н Н CI H C<sub>2</sub>H<sub>5</sub> 0 Н Н Н Н CI H  $C_2H_5$ 0 tert-C<sub>4</sub>H<sub>9</sub> Н Н Н CI H  $C_2H_5$ 2 н Н Н Н CI Н  $C_2H_5$ 2 CH<sub>3</sub> 35 CH<sub>3</sub> Н Н CI H C<sub>2</sub>H<sub>5</sub> 2 CH<sub>3</sub> Н Н Н CI H C<sub>2</sub>H<sub>5</sub> 2 C<sub>6</sub>H<sub>5</sub> н Н Н CI H C<sub>2</sub>H<sub>5</sub> 2 Н Н Н 40 CI H 2  $C_2H_5$ Н Н н CI H  $C_2H_5$ 1 н Н Н Н CI H CH<sub>3</sub> 0 Н Н н Н 45 CI H CH<sub>3</sub> 0 tert-C<sub>4</sub>H<sub>9</sub> Н Н Н CI H CH<sub>3</sub> 2 Н Н Н Н CI H CH<sub>3</sub> 2 CH<sub>3</sub> н Н Н CI Н CH<sub>3</sub> 2 iso-C<sub>3</sub>H<sub>7</sub> Н Н Н

2

2

2

55

50

CI H

CI H

CI H

CH<sub>3</sub>

CH<sub>3</sub>

CH<sub>3</sub>

CH,CH=CH,

CH<sub>3</sub>

n-C<sub>4</sub>H<sub>9</sub>

Н

Н

CH<sub>3</sub>

н

Н

Н

Н

Н

Н

Table 3 (continued)

| 5  | R <sup>1</sup> R | <sup>2</sup> R <sup>3</sup> | n_ | R <sup>4</sup>                                | R <sup>5</sup>                | R <sup>6</sup> | R <sup>7</sup> |   |
|----|------------------|-----------------------------|----|---|-------------------------------|----------------|----------------|---|
|    | CI H             | CH <sub>3</sub>             | 2  | CH <sub>2</sub> C <sub>6</sub> H <sub>5</sub> | Н                             | Н              | Н              | - |
|    | CI H             | CH <sub>3</sub>             | 2  | CH <sub>3</sub>                               | C <sub>6</sub> H <sub>5</sub> | Н              | Н              |   |
|    | CI H             | CH <sub>3</sub>             | 2  | C <sub>6</sub> H <sub>5</sub>                 | н                             | н              | н              |   |
| 10 | CI H             | CH <sub>3</sub>             | 2  | -√_>-cı                                       | Н                             | Н              | Н              |   |
|    | CI H             | CH <sub>3</sub>             | 2  | -√_>CI  | н                             | н              | Н              |   |
| 15 | сі н             | CH <sub>3</sub>             | 2  | CI<br>————————————————————————————————————    | н                             | Н              | н              |   |
|    | ÇI H             | CH <sub>3</sub>             | 2  | {_}}-Br                                       | н                             | н              | н              |   |
| 20 | CI H             | CH <sub>3</sub>             | 2  | -{_}-a•j                                      | н                             | Н              | н              |   |
|    | CI H             | CH <sub>3</sub>             | 2  | (}-coF₃                                       | Н                             | Н              | Н              |   |
|    | CI H             | CH <sub>3</sub>             | 2  | -√_>-oo+j                                     | н                             | Н              | Н              |   |
| 25 | сі н             | CH <sub>3</sub>             | 2  | CI<br>  | н                             | н              | н              |   |
|    | CI H             | CH <sub>3</sub>             | 2  | -{_}-a+a+g₂                                   | н                             | Н              | Н              |   |
| 30 | CI H             | CH <sub>3</sub>             | 2  | -\(\bar{-}\)\-\NO_2                           | Н                             | н              | Н              |   |
|    | CI H             | CH <sub>3</sub>             | 2  | -√_}-F  | Н                             | н              | н              |   |
|    | CI H             | CH <sub>3</sub>             | 1  | н   | Н                             | н              | Н              |   |
| 35 | CI H             | ~                           | 0  | Н   | Н                             | Н              | Н              |   |
|    | CI H             | 4                           | 1  | Н   | Н                             | Н              | н              |   |
|    | CI H             | 3                           | 0  | Н   | Н                             | Н              | н              |   |
|    | CI H             | 2 3                         | 0  | Н   | Н                             | Н              | н              |   |
| 40 | CI H             | 2 2                         | 0  | Н   | Н                             | Н              | н              |   |
|    | CI H             | CH,CHF,                     | 0  | Н   | н                             | Н              | н              |   |

|           |                  |       |                                   |     |                | Tab     | le 4           | ·                     |                 |                                    |  |
|-----------|------------------|-------|-----------------------------------|-----|----------------|---------|----------------|-----------------------|-----------------|------------------------------------|--|
| 5         | R NH-C-N 11 2 11 |       |                                   |     |                |         |                |                       |                 |                                    |  |
| 10        |                  |       |                                   | R R |                | % N=C \ | \frac{1}{2}    | ,S(C<br>CH<br>I₂<br>R | 3<br>0)n-R      |                                    |  |
| 15        |                  |       |                                   |     |                |         |                | Ŕ                     |                 |                                    |  |
|           | R <sup>1</sup>   | $R^2$ | R <sup>3</sup>                    | n   | R <sup>5</sup> | $R^6$   | R <sup>7</sup> | Z                     | R <sup>10</sup> | R <sup>11</sup>                    |  |
|           | Br               | H     | CH <sub>3</sub>                   | 0   | H              | н       | H              | 0                     | н               | C <sub>6</sub> H <sub>5</sub>      |  |
| -         | Br               | Н     | CH <sub>3</sub>                   | 0   | Н              | Н       | Н              | 0                     | Н               | н                                  |  |
| 20        | Br               | Н     | CH <sub>3</sub>                   | 0   | Н              | Н       | Н              | S                     | Н               | Н                                  |  |
|           | Br               | Н     | CH <sub>3</sub>                   | 1   | Н              | Н       | H              | 0                     | Н               | Н                                  |  |
|           | CI               | Н     | CH <sub>2</sub> CF <sub>3</sub>   | 0   | Н              | Н       | Н              | 0                     | Н               | Н                                  |  |
|           | CI               | Н     | CH <sub>2</sub> CF <sub>3</sub>   | 0   | Н              | Н       | Н              | S                     | Н               | Н                                  |  |
| 25        | CI               | Н     | CH <sub>2</sub> CH <sub>2</sub> F | 0   | Н              | Н       | Н              | 0                     | Н               | Н                                  |  |
|           | CI               | Н     | CH <sub>2</sub> CH <sub>2</sub> F | 0   | Н              | Н       | Н              | S                     | Н               | Н                                  |  |
|           | CI               | Н     | CH <sub>2</sub> CHF <sub>2</sub>  | 0   | Н              | Н       | Н              | 0                     | Н               | Н                                  |  |
|           | CI               | Н     | CH <sub>2</sub> CHF <sub>2</sub>  | 0   | Н              | Н       | Н              | S                     | Н               | Н                                  |  |
| 30        | Ci               | Н     | CH₃                               | 0   | Н              | Н       | Н              | S                     | CH <sub>3</sub> | CH <sub>3</sub>                    |  |
|           | CI               | Н     | CH <sub>3</sub>                   | 0   | Н              | Н       | Н              | 0                     | Н               | C <sub>2</sub> H <sub>5</sub>      |  |
|           | CI               | Н     | CH <sub>3</sub>                   | 0   | Н              | Н       | Н              | 0                     | н               | - <b>⟨_</b> }-cı                   |  |
| <i>35</i> | CI               | Н     | CH <sub>3</sub>                   | 0   | Н              | Н       | Н              | 0                     | Н               | -{_}-\\\                           |  |
|           | Cl               | Н     | CH <sub>3</sub>                   | 0   | Н              | Н       | Н              | 0                     | Н               | C <sub>6</sub> H <sub>5</sub>      |  |
|           | CI               | Н     | CH <sub>3</sub>                   | 0   | Н              | Н       | H              | S                     | Н               | C <sub>s</sub> H <sub>5</sub>      |  |
|           | CI               | Н     | CH <sub>3</sub>                   | 0   | Н              | Н       | Н              | 0                     | Н               | CH <sub>2</sub> CH <sub>2</sub> CI |  |
| 40        | CI               | Н     | CH <sub>3</sub>                   | 0   | Н              | Н       | н              | 0                     | Н               | CH <sub>3</sub>                    |  |
|           | CI               | Н     | CH <sub>3</sub>                   | 0   | Н              | Н       | Н              | S                     | Н               | CH₃                                |  |
|           | CI               | Н     | CH₃                               | 0   | Н              | Н       | Н              | 0                     | Н               | н                                  |  |
|           | CI               | Н     | CH <sub>3</sub>                   | 0   | Н              | Н       | Н              | s                     | Н               | Н                                  |  |
| 45        | CI               | Н     | CH <sub>3</sub>                   | 2   | Н              | Н       | Н              | 0                     | Н               | C <sub>2</sub> H <sub>5</sub>      |  |
|           | CI               | Н     | CH <sub>3</sub>                   | 2   | Н              | Н       | Н              | S                     | Н               | H                                  |  |

Table 4 (continued)

| 5  | R <sup>1</sup> | R <sup>2</sup> | R <sup>3</sup>  | n | R <sup>5</sup> | R <sup>6</sup> | R <sup>7</sup> | Z | R <sup>10</sup> | R <sup>11</sup>                            |
|----|----------------|----------------|-----------------|---|----------------|----------------|----------------|---|-----------------|--|
|    | CI             | Н              | CH <sub>3</sub> | 1 | Н              | н              | Н              | s | Н               | Н  |
| 10 | CI             | н              | CH <sub>3</sub> | 0 | Н              | Н              | Н              | 0 | Н               | CI<br>———————————————————————————————————— |
|    | CI             | н              | CH <sub>3</sub> | 0 | Н              | Н              | Н              | 0 | Н               | H <sub>3</sub> CO                          |
| 15 | CI             | Н              | CH <sub>3</sub> | 0 | Н              | Н              | Н              | s | н               | <b>-</b> ⟨ <u>-</u> ⟩                      |

20 In process (a), if, for example, 4-chloro-4'-methylmercaptomethylbenzophenone and ethyl carbazate are used as the starting materials, the reaction is illustrated by the following equation:

25
$$CI \xrightarrow{C} CH_{\overline{2}} S \cdot CH_{3} + H_{2}N - NH \cdot C \cdot O \cdot C_{2}H_{5}$$

$$NH - C - O - C_{2}H_{5}$$

$$NH - C - O - C_{2}H_{5}$$

$$CI \xrightarrow{C} CH_{\overline{2}}S - CH_{3}$$

45

50

55

In process (b), if, for example, 4-chloro-4'-methylmercaptomethylbenzophenone hydrazone and 4-trifluoro-methoxyphenyl isocyanate are used as the starting materials, the reaction is illustrated by the following equation:

In process (c), if, for example, 4-chloro-4'-methylmercaptomethylbenzophenone hydrazone and isobutyl chlorocarbonate are used as the starting materials, the reaction is illustrated by the following equation:

25
$$\begin{array}{c}
 & \text{NH}_{2} \\
 & \text{N} \\
 & \text{CI}
\end{array}$$

$$\begin{array}{c}
 & \text{CI} \\
 & \text{CH}_{2}\text{S}-\text{CH}_{3}
\end{array}$$

$$\begin{array}{c}
 & \text{O} \\
 & \text{II} \\
 & \text{CI}
\end{array}$$

$$\begin{array}{c}
 & \text{O} \\
 & \text{II} \\
 & \text{NH}\cdot\text{C}\cdot\text{O}-\text{CH}_{2}\text{CH}(\text{CH}_{3})_{3}
\end{array}$$

$$\begin{array}{c}
 & \text{O} \\
 & \text{NH}\cdot\text{C}\cdot\text{O}-\text{CH}_{2}\text{CH}(\text{CH}_{3})_{3}
\end{array}$$

$$\begin{array}{c}
 & \text{NH}\cdot\text{C}\cdot\text{O}-\text{CH}_{2}\text{CH}(\text{CH}_{3})_{3}
\end{array}$$

$$\begin{array}{c}
 & \text{NH}\cdot\text{C}\cdot\text{O}-\text{CH}_{2}\text{CH}(\text{CH}_{3})_{3}
\end{array}$$

$$\begin{array}{c}
 & \text{NH}\cdot\text{C}\cdot\text{O}-\text{CH}_{2}\text{CH}(\text{CH}_{3})_{3}
\end{array}$$

40

45

50

55

In process (d), if, for example, 4-chloro-4'-methylmercaptomethylbenzophenone ethoxycarbonylhydrazone and methyliodide are used as the starting materials, the reaction is illustrated by the following equation:

20

25

45

50

55

In process (e), if, for example, 4-chloro-4'-methylmercaptomethylbenzophenone ethoxycarbonylhydrazone is oxidized by sodium periodate, the reaction is illustrated by the following equation:

In process (f), if, for example, 4-chloro-4'-methylmercaptomethylbenzophenone ethoxycarbonylhydrazone is oxi-40 dized by m-chloroperbenzoic acid, the reaction is illustrated by the following equation:

In process (a), the compounds of the formula (II) mean compounds based on the above definitions of R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>6</sup>, R<sup>7</sup> and n, preferably compounds based on the above preferred definitions.

The starting compounds of the formula (II) are novel, and can be obtained by the following processes: (g) in the case where n is 0: compounds of the formula (XI)

$$\begin{array}{c}
R^{6} & O \\
R^{7} & CH-hal \\
R^{2}
\end{array}$$
(XI)

wherein R<sup>1</sup>, R<sup>2</sup>, R<sup>6</sup>, R<sup>7</sup> and hal have the same meaning mentioned above, are reacted with compounds of the formula (XII) or salts thereof

wherein R3 has the same meaning mentioned above,

in the presence of inert solvent, and if appropriate, in the presence of an acid binder,

(h) in the case where n is 0:

compounds of the formula (XIII) or salts thereof

wherein R1, R2, R6 and R7 have the same meaning mentioned above, are reacted with compounds of the formula (XIV)

$$R^{15}-R^3 (XIV)$$

5

wherein R<sup>3</sup> has the same meanings mentioned above, and R<sup>15</sup> is chlorine, bromine or iodine; in the presence of an inert solvent, and if appropriate, in the presence of an acid binder,

(i) in the case where n is 0 and R<sup>1</sup> is fluorine or chlorine:

compounds of the formula (XV)

NC 
$$R^7$$
  $S-R^3$  (XV)

20

15

wherein R2, R3 and R7 have the same meaning mentioned above, are reacted with compounds of the formula (XVI)

25

$$\mathbb{R}^{16} \longrightarrow \mathbb{R}^{17}$$
 (XVI)

30

wherein R<sup>6</sup> has the same meaning mentioned above and R<sup>16</sup> is fluorine or chlorine, and R<sup>17</sup> is lithium, magnesium bromide or magnesium iodide, in the presence of an inert solvent, and if appropriate, in the presence of an acid binder, 35

(k) in the case where n is 0: compounds of the formula (XVII

40

$$R^{17} \xrightarrow{R^7} CH-S-R^3$$
(XVII)

45

wherein R2, R3, R7 and R16 have the same meanings as mentioned above, are reacted with compounds of the 50 formula (XVIII)

wherein R1 and R6 have the same meanings as mentioned above, in the presence of an inert solvent,

or (m) in the case where n is 0,  $R^2$  is hydrogen and  $R^3$  is perfluoroalkyl, then  $R^3$  is replaced by  $R^{18}$ : compounds of the formula (XIX)

wherein  $R^1$ ,  $R^6$  and  $R^7$  have same meaning as mentioned above, are reacted with compounds of the formula (XX)

R<sup>18</sup>-I XX()

wherein  $R^{18}$  is  $C_{1-4}$  perfluoroalkyl, o in the presence of an inert solvent, an if appropriate, in the presence of an acid binder,

(n) in the case where n is 0 and  $R^2$  is  $C_{1-4}$  alkyl, then  $R^2$  is replaced by  $R^{19}$ : compounds of the formula (XXI)

 $R^{1} \xrightarrow{C} \xrightarrow{C} R^{7} CH_{2}-S-R^{3}$ (XXI)

wherein R<sup>1</sup>, R<sup>3</sup>, R<sup>6</sup> and R<sup>7</sup> have same meaning as mentioned above, are reacted with compounds of the formula

wherein hall has the same meaning as mentioned above and  $R^{19}$  is  $C_{1-4}$  alkyl, in the presence of an inert solvent, and if appropriate in the presence of an acid binder, or

(p) in the case where n is 1:

5

25

30

35

50

40 compounds of the formula (XXIII)

 $R^{6} \qquad \qquad \begin{array}{c} O \\ II \\ C \\ C \\ C \\ C \\ R^{7} \end{array}$   $CH-S-R^{3}$   $R^{2} \qquad \qquad (XXIII)$ 

wherein  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^6$  and  $R^7$  have the same meaning mentioned above, are oxidized, if appropriate, in the presence of an inert solvent,

(q) in the case where n is 2: compounds of the formula (XXIV)

55 Compounds of the formula (AATV)

$$R^{6} \qquad \qquad \downarrow \\ R^{1} \qquad \qquad \downarrow \\ R^{1} \qquad \qquad \downarrow \\ CH-S(O)q-R^{3} \qquad \qquad (XXIV)$$

wherein  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^6$ ,  $R^7$  and q have the same meaning mentioned above, are oxidized, if appropriate, in the presence of an inert solvent.

Examples of the compounds of the formula (II) are shown in Table 5:

Table 5

|      | R <sup>1</sup> | R <sup>6</sup> | R <sup>7</sup> | A   | R <sup>1</sup> | R <sup>6</sup> | R <sup>7</sup>    | A  |
|------|----------------|----------------|----------------|---|----------------|----------------|-------------------|--|
|      | Br             | Н              | Н              | CH(CH <sub>3</sub> )SCH <sub>3</sub>                              | CI             | Н              | н.                | CH <sub>2</sub> S(CH <sub>2</sub> ) <sub>3</sub> F                 |
|      | Br             | Н              | Н              | CH(CH3)SO2CH3   | CI             | Н              | Н                 | CH <sub>2</sub> SC <sub>2</sub> H <sub>5</sub>                     |
| 15   | Br             | Н              | Н              | CH(CH <sub>3</sub> )SOCH <sub>3</sub>                             | CI             | н              | Н                 | CH <sub>2</sub> SC <sub>3</sub> H <sub>7</sub> -iso                |
|      | Br             | Н              | Н              | CH <sub>2</sub> SC <sub>2</sub> H <sub>5</sub>                    | CI             | н              | н                 | CH <sub>2</sub> SC <sub>3</sub> H <sub>7</sub> -n                  |
|      | Br             | Н              | Н              | CH <sub>2</sub> SC <sub>3</sub> H <sub>7</sub> -n                 | CI             | Н              | Н                 | CH₂SC₄H <sub>9</sub> -n  |
| ÷    | Br             | Н              | Н              | CH <sub>2</sub> SCF <sub>3</sub>                                  | CI             | Н              | н                 | CH <sub>2</sub> SC <sub>4</sub> H <sub>9</sub> -sec                |
| 20   | Br             | Н              | Н              | CH <sub>2</sub> SCH <sub>2</sub> CF <sub>3</sub>                  | CI             | Н              | Н                 | CH <sub>2</sub> SCF <sub>2</sub> CF <sub>2</sub> CF <sub>3</sub>   |
|      | Br             | Н              | Н              | CH₂SCH₂CH≃CH₂   | CI             | Н              | н                 | CH <sub>2</sub> SCF <sub>2</sub> CF <sub>3</sub>                   |
|      | Br             | Н              | Н              | CH <sub>2</sub> SCH <sub>2</sub> CH <sub>2</sub> F                | CI             | н              | н                 | CH <sub>2</sub> SCF <sub>2</sub> CHF <sub>2</sub>                  |
|      | 8r             | Н              | Н              | CH <sub>2</sub> SCH <sub>2</sub> CHF <sub>2</sub>                 | CI             | Н              | н                 | CH <sub>2</sub> SCF <sub>3</sub>                                   |
| 25   | Br             | Н              | Н              | CH <sub>2</sub> SCH <sub>2</sub> F                                | CI             | Н              | Н                 | CH <sub>2</sub> SCH <sub>2</sub> C≡CH                              |
| 20   | Br             | Н              | н              | CH₂SCH₃   | CI             | Н              | н                 | CH <sub>2</sub> SCH <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> H |
|      | Br             | Н              | Н              | CH <sub>2</sub> SCHF <sub>2</sub>                                 | CI             | Н              | Н                 | CH <sub>2</sub> SCH <sub>2</sub> CF <sub>2</sub> CF <sub>3</sub>   |
|      | Br             | Н              | Н              | CH <sub>2</sub> SO <sub>2</sub> C <sub>2</sub> H <sub>5</sub>     | CI             | Н              | н                 | CH <sub>2</sub> SCH <sub>2</sub> CF <sub>3</sub>                   |
|      | Br             | Н              | Н              | CH <sub>2</sub> SO <sub>2</sub> C <sub>3</sub> H <sub>7</sub> -n  | CI             | Н              | н                 | CH,SCH=CH,   |
| 30   | Br             | Н              | Н              | CH2SO2CH2CF3  | CI             | Н              | н                 | CH2SCH2CH=CH2  |
|      | Br             | Н              | Н              | CH2SO2CH2CH=CH2   | CI             | Н              | н                 | CH2S CH2CH2CH2CI   |
|      | Br             | Н              | Н              | CH <sub>2</sub> SO <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> F | CI             | Н              | Н                 | CH <sub>2</sub> SCH <sub>2</sub> CH <sub>2</sub> CI                |
|      | Вr             | Н              | н              | CH <sub>2</sub> SO <sub>2</sub> CH <sub>2</sub> CHF <sub>2</sub>  | CI             | Н              | Н                 | CH <sub>2</sub> SCH <sub>2</sub> CH <sub>2</sub> F                 |
| 35   | Br             | Н              | Н              | CH <sub>2</sub> SO <sub>2</sub> CH <sub>3</sub>                   | CI             | H-             | Н                 | CH <sub>2</sub> SCH <sub>2</sub> CHF <sub>2</sub>                  |
|      | Br             | н              | Н              | CH <sub>2</sub> SOC <sub>2</sub> H <sub>5</sub>                   | CI             | Н              | н                 | CH <sub>2</sub> SCH <sub>2</sub> CN                                |
|      | Br             | Н              | Н              | CH <sub>2</sub> SOC3H <sub>7</sub> -n                             | CI             | Н              | Н                 | CH <sub>2</sub> SCH <sub>2</sub> F                                 |
|      | Br             | Н              | Н              | CH <sub>2</sub> SOCH <sub>2</sub> CF <sub>3</sub>                 | CI             | Н              | н                 | CH <sub>2</sub> SCH <sub>2</sub> CI                                |
|      | Br             | Н              | Н              | CH2SOCH2CH=CH2  | Cî             | н              | Н                 | CH <sub>2</sub> SCH <sub>3</sub>                                   |
| 40 - | Br             | Н              | Н              | CH2SOCH2CH2F  | CI             | Н              | 2-CI              | CH <sub>2</sub> SCH <sub>3</sub>                                   |
|      | Br             | Н              | н              | CH2SOCH2CHF2  | CI             | н              | 3-CI              | CH <sub>2</sub> SCH <sub>3</sub>                                   |
|      | Br             | Н              | Н              | CH <sub>2</sub> SOCH <sub>2</sub> F                               | CI             | н              | 2-F               | CH₂SCH₃  |
|      | Br             | Н              | Н              | CH <sub>2</sub> SOCH <sub>3</sub>                                 | CI             | Н              | 3-F               | CH <sub>2</sub> SCH <sub>3</sub>                                   |
| 45   | Br             | Н              | Н              | CH <sub>2</sub> SOCHF <sub>2</sub>                                | CI             | н              | 2-Br              | CH <sub>2</sub> SCH <sub>3</sub>                                   |
|      | CI             | Н              | н              | CH(C2H5)SCH3  | CI             | н              | 3-Br              | CH <sub>2</sub> SCH <sub>3</sub>                                   |
|      | CI             | Н              | Н              | CH(C2H5)SO2CH3  | CI             | н              | 3-CH <sub>3</sub> | CH <sub>2</sub> SCH <sub>3</sub>                                   |
|      | CI             | Н              | Н              | CH(C2H5)SOCH3   | CI             | н              | 2-CH <sub>3</sub> | CH <sub>2</sub> SCH <sub>3</sub>                                   |
| 50   | CI             | Н              | Н              | CH(CH <sub>3</sub> )SCH <sub>3</sub>                              | CI             | Н              | н                 | CH <sub>2</sub> SCHF <sub>2</sub>                                  |
| 50   | CI             | Н              | Н              | CH(CH <sub>3</sub> )SO <sub>2</sub> CH <sub>3</sub>               | CI             | Н              | Н                 | CH <sub>2</sub> SO <sub>2</sub> C <sub>2</sub> H <sub>5</sub>      |
|      | CI             | Н              | Н              | CH(CH3)SOCH3  | CI             | Н              | Н                 | CH <sub>2</sub> SO <sub>2</sub> C <sub>3</sub> H <sub>7</sub> -n   |
|      | CI             | Н              | Н              | CH(n-C <sub>3</sub> H <sub>7</sub> )SCH <sub>3</sub>              | CI             | Н              | Н                 | CH <sub>2</sub> SO <sub>2</sub> CH <sub>2</sub> C≡CH               |

# Table 5 (continued)

|    |                |                |                   |  |                |                |                | -   |
|----|----------------|----------------|-------------------|--|----------------|----------------|----------------|---|
| 5  | R <sup>1</sup> | R <sup>6</sup> | R <sup>7</sup>    | A  | R <sup>1</sup> | R <sup>6</sup> | R <sup>7</sup> | Α   |
|    | CI I           | Н              | Н                 | CH2SO2CH2CF3   | CI             | 3-F            | Н              | CH₂SCH₃   |
|    | CI I           | H              | Н                 | CH2SO2CH2CH=CH2                                      | CI             | 2-CI           | Н              | CH <sub>2</sub> SO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    | CI I           | Н              | Н                 | CH2SO2CH2CH2CH2F                                     | CI             | 2-F            | н              | CH <sub>2</sub> SO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
| 10 | CI H           | H              | Н                 | CH2SO2 CH2CH2CH2CI                                   | CI             | 3-F            | Н              | CH <sub>2</sub> SO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
| 70 | CI I           | H              | Н                 | CH2SO2CH2CH2CI                                       | CI             | 2-CI           | н              | CH <sub>2</sub> SO <sub>2</sub> CH <sub>3</sub>               |
|    | CI I           | Н              | Н                 | CH2SO2CH2CH2F  | CI             | 2-F            | Н              | CH <sub>2</sub> SO <sub>2</sub> CH <sub>3</sub>               |
|    | CI F           | H              | Н                 | CH2SO2CH2CHF2  | CI             | 3-F            | Н              | CH <sub>2</sub> SO <sub>2</sub> CH <sub>3</sub>               |
|    | CI I           | Н              | Н                 | CH2SO2CH3  | CI             | 2-CI           | Н              | CH <sub>2</sub> SOC <sub>2</sub> H <sub>5</sub>               |
| 15 | CI I           | Н              | 2-CI              | CH <sub>2</sub> SO <sub>2</sub> CH <sub>3</sub>      | CI             | 2-F            | Н              | CH <sub>2</sub> SOC <sub>2</sub> H <sub>5</sub>               |
|    |                | Н              | 3-CI              | CH <sub>2</sub> SO <sub>2</sub> CH <sub>3</sub>      | CI             | 3-F            | Н              | CH <sub>2</sub> SOC <sub>2</sub> H <sub>5</sub>               |
|    |                | Н              | 2-F               | CH <sub>2</sub> SO <sub>2</sub> CH <sub>3</sub>      | CI             | 2-CI           | H              | CH2SOCH3  |
|    | CI I           | Н              | 3-F               | CH <sub>2</sub> SO <sub>2</sub> CH <sub>3</sub>      | CI             | 2-F            | Н              | CH <sub>2</sub> SOCH <sub>3</sub>                             |
| 20 |                | Н              | 2-Br              | CH2SO2CH3  | CI             | 3-F            | Н              | CH <sub>2</sub> SOCH <sub>3</sub>                             |
|    | CI I           | Н              | 3-Br              | CH <sub>2</sub> SO <sub>2</sub> CH <sub>3</sub>      | CI             | 3-CI           | Н              | CH <sub>2</sub> SC <sub>2</sub> H <sub>5</sub>                |
|    | CI I           | Н              | 3-CH <sub>3</sub> | CH <sub>2</sub> SO <sub>2</sub> CH <sub>3</sub>      | CI             | 3-CI           | Н              | CH <sub>2</sub> SCH <sub>3</sub>                              |
|    | CI I           | Н              | 2-CH <sub>3</sub> | CH <sub>2</sub> SO <sub>2</sub> CH <sub>3</sub>      | CI             | 3-CI           | Н              | CH <sub>2</sub> SO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
| 25 |                | Н              | Н                 | CH <sub>2</sub> SOC <sub>2</sub> H <sub>5</sub>      | CI             | 3-C1           | Н              | CH <sub>2</sub> SO <sub>2</sub> CH <sub>3</sub>               |
|    | CI I           | Н              | Н                 | CH <sub>2</sub> SOC <sub>3</sub> H <sub>7</sub> -n   | CI             | 3-C1           | Н              | CH <sub>2</sub> SOC <sub>2</sub> H <sub>5</sub>               |
|    |                | H              | Н                 | CH₂SOCH₂C≡CH   | CI             | 3-CI           | н              | CH <sub>2</sub> SOCH <sub>3</sub>                             |
|    |                | Н              | Н                 | CH2SOCH2CF3  | F              | Н              | Н              | CH <sub>2</sub> SC <sub>2</sub> H <sub>5</sub>                |
|    |                | Н              | Н                 | CH2SOCH2CH=CH2                                       | F              | Н              | Н              | CH <sub>2</sub> SCH <sub>3</sub>                              |
| 30 |                | Н              | Н                 | CH2SO CH2CH2CH2CI                                    | F              | Н              | Н              | CH <sub>2</sub> SO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    |                | H              | Н                 | CH <sub>2</sub> SOCH <sub>2</sub> CH <sub>2</sub> CI | F              | Н              | Н              | CH <sub>2</sub> SO <sub>2</sub> CH <sub>3</sub>               |
|    |                | H              | Н                 | CH <sub>2</sub> SOCH <sub>2</sub> CH <sub>2</sub> F  | F              | Н              | Н              | CH2SOC2H5   |
|    |                | Н              | Н                 | CH2SOCH2CHF2   | F              | Н              | H              | CH2SOCH3  |
| 35 |                | H              | Н                 | CH <sub>2</sub> SOCH <sub>2</sub> F                  | F              | 3-F-           | Н              | CH2SC2H5  |
|    |                | Н              | Н                 | CH <sub>2</sub> SOCH <sub>3</sub>                    | F              | 3-F            | Н              | CH <sub>2</sub> SCH <sub>3</sub>                              |
|    |                | Н              | 2-CI              | CH2SOCH3   | F              | 3-F            | Н              | CH <sub>2</sub> SO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    |                | Н              | 3-CI              | CH2SOCH3   | F              | 3-F            | Н              | CH2SO2CH3   |
| 40 |                | Н              | 2-F               | CH2SOCH3   | F              | 3-F            | Н              | CH <sub>2</sub> SOC <sub>2</sub> H <sub>5</sub>               |
| *  |                | Н              | 3-F               | CH2SOCH3   | F              | 3-F            | Н              | CH₂SOCH₃  |
|    |                | Н              | 2-Br              | CH2SOCH3   | ı              | Н              | Н              | CH <sub>2</sub> SC <sub>2</sub> H <sub>5</sub>                |
|    |                | Н              | 3-Br              | CH <sub>2</sub> SOCH <sub>3</sub>                    | 1              | Н              | Н              | CH <sub>2</sub> SCF <sub>3</sub>                              |
| 45 |                | Н              | 3-CH <sub>3</sub> | CH <sub>2</sub> SOCH <sub>3</sub>                    | 1              | Н              | Н              | CH <sub>2</sub> SCH <sub>2</sub> CF <sub>3</sub>              |
| 40 |                | Н              | 2-CH <sub>3</sub> | CH2SOCH3   | I              | Н              | Н              | CH2SCH2CH2F   |
|    |                | H<br>          | Н                 | CH <sub>2</sub> SOCHF <sub>2</sub>                   | i              | Н              | Н              | CH2SCH2CHF2   |
|    |                | 2-CI           | Н                 | CH <sub>2</sub> SC <sub>2</sub> H <sub>5</sub>       | ı              | Н              | Н              | CH₂SCH₃   |
|    |                | 2-F            | Н                 | CH <sub>2</sub> SC <sub>2</sub> H <sub>5</sub>       | ١              | Н              | Н              | CH <sub>2</sub> SCHF <sub>2</sub>                             |
| 50 |                | 3-F            | H                 | CH <sub>2</sub> SC <sub>2</sub> H <sub>5</sub>       | 1              | H              | Н              | CH <sub>2</sub> SO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
|    |                |                | Н                 | CH <sub>2</sub> SCH <sub>3</sub>                     | 1              | Н              | Н              | CH <sub>2</sub> SO <sub>2</sub> CH <sub>3</sub>               |
|    | CI 2           | 2-F            | Н                 | CH₂SCH₃  | 1              | Н              | Н              | CH <sub>2</sub> SOC <sub>2</sub> H <sub>5</sub>               |
|    |                |                |                   |  |                |                |                |   |

Table 5 (continued)

| 5  | R <sup>1</sup> | R <sup>6</sup> | R <sup>7</sup> | Α   |
|----|----------------|----------------|----------------|---|
|    | 1              | Н              | Н              | CH <sub>2</sub> SOCH <sub>3</sub>   |
|    | CI             | Н              | Н              | CH <sub>2</sub> SOCH <sub>3</sub>   |
|    | CI             | Н              | Н              | CH <sub>2</sub> SCN   |
| 10 | CI             | Н              | Н              | CH2SCSOCH3  |
|    | CI             | Н              | Н              | CH2CSOC2H5  |
|    | CI             | Н              | Н              | CH2SCH2Si(CH3)3   |
|    | CI             | Н              | Н              | CH2SOCH2Si(CH3)3  |
| 15 | CI             | Н              | Н              | CH2SO2CH2Si(CH3)3   |
|    | Br             | Н              | Н              | CH2SCH2Si(CH3)3   |
|    | Br             | Н              | Н              | CH2SOCH2Si(CH3)3  |
|    | Br             | Н              | Н              | CH <sub>2</sub> SO <sub>2</sub> CH <sub>2</sub> Si(CH <sub>3</sub> ) <sub>3</sub> |
| 20 |                |                |                |   |

In the process (g), the starting materials of the formula (XI) are in part known, for example, 4-chloro-4'-chloromethylbenzophenone is described in Japanese Patent Kokoku Publication Sho 46-10164 together with production method thereof, or the staring materials of the formula (XI) can be obtained by halogenating benzophenones of the formula (XXV)

wherein, R<sup>1</sup>, R<sup>2</sup>, R<sup>6</sup> and R<sup>7</sup> have the same meanings as mentioned above, according to conventional methods, using, for example, N-bromosuccinimide or N-chlorosuccinimide as halogenating agent.

The compounds of the formula (XXV) can be obtained by a Friedel-Crafts reaction wherein substituted benzoyl halides and alkyl-substituted benzenes are used as starting materials, and aluminum chloride is used as a catalyst.

The compounds of the formula (XI) may be exemplified as follows:

4-chloro-4'-chloromethylbenzophenone,

50

- 4-chloromethyl-4'-fluorobenzophenone,
- 4-bromo-4'-chloromethylbenzophenone.
- 4-bromomethyl-4'-chlorobenzophenone,
- 4-bromomethyl-4'-fluorobenzophenone,
- 4-bromo-4'-bromomethylbenzophenone,
  - 4-(1-bromoethyl)-4'-chlorobenzophenone.
  - 4-(1-bromopropyl)-4'-chlorobenzophenone, and the like.

In the above process (g), the compounds of the formula (XII) are well known in the field of organic chemistry and, for example, there may be mentioned: methylmercaptan and salts thereof, ethylmercaptan and salts thereof, and the like.

In the above process (h), the compounds of the formula (XIII) are novel and such compounds can be synthesized by, for instance, reacting benzophenones of the above formula (XI) with thiourea. This reaction is well known per se in the field of organic chemistry and can be carried out by the method analogous to that described in "Jikken Kagaku Koza

(Experimental Chemistry Course)" fourth edition, edited by Japanese Chemical Society, Vol. 25, page 336, 1992, published by Maruzen.

Examples of the compounds of the formula (XIII) are are shown in following Table 6.

5

Table 6

In the process (h), the compounds of the formula (XIV) are known in the field of organic chemistry and, for example, there may be mentioned: methyl iodide, ethyl iodide, methyl bromide, ethyl bromide, boromodifluoromethane, iodotrifluoromethane, 1-bromo-2-fluoroethane, 1-bromo-2-chloroethane, 2,2,2-trifluoro-1-iodoethane, 1-bromo-2,2-difluoroethane, and the like.

In the process (j), the compounds of the formula (XV) can be obtained when compounds of the formula (XXVI)

NC 
$$\mathbb{R}^7$$
 (XXVI)

wherein R2 and R7 are defined as above,

are reacted with the compound of the formula (XII),

in the presence of an acid binder, and, if appropriate, in the presence of an inert solvent, under the same reaction conditions as described for process (g).

The compounds of the formula (XXVI) are well known and include the following: 4-cyanobenzyl bromide, 4-cyanobenzyl chloride, and the like.

In the process (j), the compounds of the formula (XV) are well known and exemplified by the following compounds: 4-methylmercaptobenzonitril, and the like.

In the process (j), the compounds of the formula (XVI) are obtained by metalation of compounds of the formula (XXVII)

$$\mathbb{R}^{16} \longrightarrow \mathbb{R}^{20}$$
 (XXVII)

wherein  $R^6$  and  $R^{16}$  have same meaning as mentioned above, and  $R^{20}$  is bromine or iodine, with alkyllithium or magnesium,

in the presence of an inert solvent, and, if appropriate, in the presence of a catalyst.

The following compounds of the formula (XXVII) may be mentioned: 4-fluorobromobenzen, 4-fluoroiodobenzen, 4-chlorobromobenzen, 4-chlorobromobenzene, 2-fluoro-4-chlorobromobenzene, 3-fluoro-4-chlorobromobenzene, and the like.

In the process (k), the compounds of the formula (XVII) are obtained by metalation of compounds of the formula (XXVIII)

$$R^{20} \xrightarrow{R^7} CH-S-R^3$$

$$R^2 \qquad (XXVIII)$$

35

40

45

50

55

30

25

5

15

wherein,  $R^2$ ,  $R^3$ ,  $R^7$  and  $R^{20}$  have same meaning mentined above, with alkyllithium or magnesium, in the presence of an inert solvent, and, if appropriate, in the presence of a catalyst.

The compounds of the formula (XXVIII) are well known and include the following:

4-methylthiomethylbromobenzene, 4-methylthiomethyliodobenzene, 4-ethylthiomethylbromobenzene, 4-ethylthiomethyliodobenzene, and the like.

In the process (m), the compounds of the formula (XIX) are well known compounds in the field of organic chemistry, and include the following: 4-(4-chlorobenzoyl)benzylthiocyanate, and the like.

In the process (m), the compounds of the formula (XX) are well known compounds in the field of organic chemistry, and include the following: iodotrifluoromethane, iodopentafluoroethane, and the like.

The reaction in the process (m) can be conducted by a method analogous to that described in Journal of Fluorine Chemistry Vol.43, 27-24 (1989).

In the process (n), the compounds of the formula (XXI) are synthesized by the above processes (g) to (m) and include the following:

4-fluoro-4'-methylmercaptomethylbenzophenone,

4-chloro-4'-methylmercaptomethylbenzophenone,

4-bromo-4'-methylmercaptomethylbenzophenone,

4-iodo-4'-methylmercaptomethylbenzophenone,

4-fluoro-4'-ethylmercaptomethylbenzophenone,

4-chloro-4'-ethylmercaptomethylbenzophenone,

4-bromo-4'-ethylmercaptomethylbenzophenone, and the like.

In the process (n), the compounds of the formula (XXII) are known in the field of organic chemistry and include the following: methyl iodide, ethyl iodid , methyl bromide, ethyl bromide, and the like.

The process (n) is well known per se in the field of organic chemistry and can be carried out by, for example, the method similar to that described in "Jikken Kagaku Koza (Experimental Chemistry Course)" fourth edition, edited by Japanese Chemical Society, Vol. 25, page 329, 1992, published by Maruzen.

In the process (n), the compounds of the formula (XXIII) are synthesized by the above processes (g) to (n). As examples thereof, the following compounds in addition to those exemplified as the compounds of the above formula (XXI) may be mentioned:

```
4-bromo-4'-(1-methylmercaptoethyl)benzophenone, 4-chloro-4'-(1-methylmercaptoethyl)benzophenone,
```

4-chloro-4'-(1-methylmercaptopropyl)benzophenone,

4-chloro-4'-(1-methylmercaptobutyi)benzophenone, and the like.

As the oxidizing agents used in the above process (p), there may be mentioned, for example, aqueous hydrogen peroxide, peracetic acid, m-chloroperbenzoic acid, OXONE™, sodium periodate, t-butylhydroperoxide and N-bromosuccinimide.

The oxidation reaction in the above production methods (p) and (q) can be carried out by, for example, the method similar to that described in "Jikken Kagaku Koza (Experimental Chemistry Course)" fourth edition, edited by Japanese Chemical Society, Vol. 24, page 350 or 365, 1992, published by Maruzen.

In the above process (q), the compounds of the formula (XXIV) are synthesized by the above production methods (g) to (p). As examples thereof, the following compounds in addition to those exemplified as the compounds of the above formulae (XXI) and (XXIII) may be mentioned:

```
4-fluoro-4'-methylsulfinylmethylbenzophenone,
```

4-chloro-4'-methylsulfinylmethylbenzophenone.

4-chloro-4'-difluoromethylsulfinylmethylbenzophenone.

4-bromo-4'-methylsulfinylmethylbenzophenone.

4-iodo-4'-methylsulfinylmethylbenzophenone,

4-ethylsulfinylmethyl-4'-fluorobenzophenone.

4-chloro-4'-ethylsulfinylmethylbenzophenone,

4-bromo-4'-ethylsulfinylmethylbenzophenone,

4-bromo-4'-(1-methylsulfinylethyl)benzophenone,

4-chloro-4'-(1-methylsulfinylethyl)benzophenone,

4-chloro-4'-(1-methylsulfinylpropyl)benzophenone,

4-chloro-4'-(1-methylsulfinylbutyl)benzophenone, and the like.

As the oxidizing agents which can be used in the above production method (q), there may be mentioned, for example, potassium permanganate, sodium perborate in addition to the oxidizing agents described in connection with the above production method (p).

In the process (a), starting compounds of the formula (III) mean compounds based on the above definition of R<sup>4</sup>, preferably compounds based on the above preferred definition.

In the process (a), the compounds of the formula (III) are well known in the field of organic chemistry, and include the following:

hydrazine hydrate, methyl carbazate, ethyl carbazate, n-propyl carbazate, isopropyl carbazate, n-butyl carbazate, isobutyl carbazate, tert-butylhydrazine, acetohydrazide, benzohydrazide, semicarbazide, thiosemicarbazide, formic hydrazide, and the like.

In the processes (b) and (c), starting compounds of the formula (IV) mean compounds based on the above definition of R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>6</sup>, R<sup>7</sup> and n, preferably compounds based on the above preferred definitions.

The compounds of the formula (IV) are synthesized by the above processes (a), (d), (e) and (f). Specific examples of the compounds of the formula (IV) include the following compounds:

```
4-fluoro-4'-methylmercaptomethylbenzophenone hydrazone,
```

4-chloro-4'-methylmercaptomethylbenzophenone hydrazone,

4-chloro-4'-difluoromethylmercaptomethylbenzophenone hydrazone,

4-chloro-4'-trifluoromethylmercaptomethylbenzophenone hydrazone,

4-bromo-4'-methylmercaptomethylbenzophenone hydrazone,

4-ethylmercaptomethyl-4'-fluorobenzophenone hydrazone,

4-chloro-4'-methylsulfinylmethylbenzophenone hydrazone,

4-ethylsulfinylmethyl-4'-bromobenzophenone hydrazone,

4-bromo-4'-methylsulfonylmethylbenzophenone hydrazone,

122

50

55

10

25

30

4-chloro-4'-methylsulfonylmethylbenzophenone hydrazone, and the like.

In the process (b), the compounds of the formula (V), as the starting material, are well known in the field of organic chemistry. Examples thereof which may be mentioned are as follows:

4-trifluoromethoxyphenylisocyanate, phenylisocyanate, and the like.

In the process (c), the compounds of the formula (VI) as the starting material are well known in the field of organic chemistry. Examples thereof which may be mentioned are as follows:

methyl chlorocarbonate, ethyl chlorocarbonate, propyl chlorocarbonate, isopropyl chlorocarbonate, butyl chlorocarbonate, butyl chlorocarbonate, isobutyl chlorocarbonate, tert-butyl chlorocarbonate, methyl bromocarbonate, ethyl bromocarbonate, propyl bromocarbonate, isopropyl bromocarbonate, butyl bromocarbonate, isobutyl bromocarbonate, tert-butyl bromocarbonate, allyl bromocarbonate, acetyl chloride, acetyl bromide, propionyl chloride, butyryl chloride, isobutyryl chloride, valeryl chloride, pivaloyl chloride, and the like.

In the processes (d), the compounds of the formula (VII) are synthesized by the above processes (a), (b), (c) and (f). Examples thereof include the following compounds:

15

20

- 4-fluoro-4'-methylmercaptomethylbenzophenone hydrazone,
- 4-bromo-4'-methylmercaptomethylbenzophenone hydrazone,
- 4-iodo-4'-methylmercaptomethylbenzophenone hydrazone,
- 4-chloro-4'-ethylmercaptomethylbenzophenone hydrazone,
- 4-bromo-4'-methylmercaptomethylbenzophenone ethoxycarbonylhydrazone,
  - 4-chloro-4'-methylmercaptomethylbenzophenone ethoxycarbonylhydrazone,
  - 4-chloro-4'-ethylmercaptomethylbenzophenone ethoxycarbonylhydrazone,
  - 4-chloro-4'-(1-methylmercaptoethyl)benzophenone ethoxycarbonylhydrazone, and the like.

In the process (d), the compounds of the formula (VIII) as the starting material are those which are well known in the field of organic chemistry. Examples thereof which may be mentioned are as follows: methyl iodide, ethyl iodide, propyl iodide, chloromethyl methyl ether, chloromethyl ethyl ether, chloromethyl methyl sulfide, acetyl chloride, benzoyl chloride, cinnamoyl chloride, methylchloroformate, methyl chlorocarbonate, ethyl chlorocarbonate, propyl chlorocarbonate, isopropyl chlorocarbonate, butyl chlorocarbonate, isobutyl chlorocarbonate, tert-butyl chlorocarbonate, methyl bromocarbonate, ethyl bromocarbonate, propyl bromocarbonate, isopropyl bromocarbonate, and the like.

In the process (e), the compounds of the formula (IX) are obtained by the processes (a) to (d). Examples thereof include the following compounds, in addition to those exemplified as the compounds of formulae (IV) and (VII).

As the oxidizing agents which are used in the above processes (e) and (f), there may be mentioned the oxidizing agents described in connection with the process (n).

In the process (f), the compounds of the formula (X) are the compounds according to the invention, which are synthesized by the above processes (a) to (e). As example thereof, the following compounds in addition to those exemplified as the compounds of the above formulae (IV) and (VII) may be mentioned:

- 4-fluoro-4'-methylsulfinylmethylbenzophenone hydrazone,
- 4-bromo-4'-methylsulfinylmethylbenzophenone hydrazone,
- 4-iodo-4'-methylsulfinylmethylbenzophenone hydrazone,
- 4-chloro-4'-ethylsulfinylmethylbenzophenone hydrazone,
- 4-chloro-4'-methylsulfinylmethylbenzophenone ethoxycarbonylhydrazone, and
- 4-bromo-4'-ethylsulfinylmethylbenzophenone ethoxycarbonylhydrazone.

As are mentioned hereinabove, the compounds of the formulae (II), (XIII), (XIX), (XXII), and (XXIV) which are employed as starting materials or intermediates in the preparation of the compounds of the formula (I) are novel, and then those compounds can be represented by the following formula (XXIX):

50

40

45

$$\mathbb{R}^{1}$$
 $\mathbb{R}^{1}$ 
 $\mathbb{R}^{1}$ 
 $\mathbb{R}^{1}$ 
 $\mathbb{R}^{1}$ 
 $\mathbb{R}^{1}$ 
 $\mathbb{R}^{2}$ 
 $\mathbb{R}^{1}$ 
 $\mathbb{R}^{2}$ 
 $\mathbb{R}^{2}$ 
 $\mathbb{R}^{2}$ 
 $\mathbb{R}^{2}$ 
 $\mathbb{R}^{2}$ 

wherein

5

10

45

R<sup>1</sup> is halogen,

15 R<sup>2</sup> is hydrogen or C<sub>1-4</sub> alkyl,

R<sup>6</sup> is hydrogen or halogen,

R<sup>7</sup> is hydrogen, halogen or C<sub>1-2</sub> alkyl,

n is 0, 1 or 2,

X is cyano, optionally substituted C<sub>1-4</sub> alkyl, C<sub>2-4</sub> alkenyl, C<sub>3-4</sub> alkynyl, C<sub>1-4</sub> alkylcarbonyl, C<sub>1-4</sub> alkoxy-thiocarbonyl or carboxamidine and their salts, provided that when X is cyano, C<sub>1-4</sub> alkylcarbonyl C<sub>1-4</sub> alkoxy-thiocarbonyl or carboxamidine and their salts then n is 0.

The reaction of the above production method (a) can be carried out in an appropriate diluent. As such diluents, there may be mentioned optional inert organic solvents, for example, aliphatic, alicyclic or aromatic hydrocarbons (which may be optionally chlorinated), such as pentane, hexane, cyclohexane, petroleum ether, ligroin, benzene, toluene, xylene, dichloromethane, chloroform, carbon tetrachloride, 1,2-dichloroethane, chlorobenzene and dichlorobenzene; ethers such as ethyl ether, methyl ethyl ether, isopropyl ether, butyl ether, dioxane, dimethoxyethane (DME), tetrahydrofuran (THF) and diethylene glycol dimethyl ether (DGM); nitriles such as acetonitrile, propionitrile and acrylonitrile; alcohols, with the proviso that R<sup>3</sup> is not monohalogenomethyl, such as methanol, ethanol, isopropanol, butanol and ethylene glycol; esters such as ethyl acetate and amyl acetate; acid amides such as dimethylformamide (DMF), dimethylacetamide (DMA), N-methylpyrrolidone, 1,3-dimethyl-2-imidazolidinone and hexamethylphosphoric triamide (HMPA); and sulfones and sulfoxides such as dimethyl sulfoxide (DMSO) and sulfolan.

The reaction in the above production method (a), can be carried out in the presence of an acid cataylst. Examples of usable acid catalysts may be mentioned: mineral acids such as hydrochloric acid, sulfuric acid, phosphoric acid, hydrochromic acid, organic acids such as formic acid, acetic acid, trifluoroacetic acid, and propionic acid, methanesulfonic acid, benzenesulfonyl acid and p-toluenesulfonic acid: and organic amine hydrochlorides auch as pyridine hydrochloride and triethylamine hydrochloride and the like.

The reaction of the production method (a) can be conducted at a temperature within a substantially broad range, but it is generally possible to employ a reaction temperature of about -20 to about 200°C, preferably about 20 to about 150°C. Further, the reaction should preferably be conducted under normal pressure but it may optionally be operated under an elevated or reduced pressure.

For carrying out the production method (a), for instance, 1 mole of the compound of the formula (II) can be reacted with 1 to 10 moles of the compound of the formula (III) in a diluent such as ethanol and in the presence of an acid catalyst such as acetic acid to thereby obtain the object compound of the formula (I).

In carrying out the process (b) mentioned above, use may be made, as suitable diluent, of any inert solvent.

Examples of such diluents are aliphatic, cycloaliphatic and aromatic, optionally chlorinated, hydrocarbons such as pentane, hexane, cyclohexane, petroleum ether, ligroin, benzene, toluene, xylene, dichloromethane, chloroform, carbon tetrachloride, 1,2-dichloroethane, chlorobenzene, dichlorobenzene and the like; ethers such as diethyl ether, methyl ethyl ether, diisopropyl ether, dibutyl ether, dioxane, dimethoxyethane(DME), tetrahydrofurane (THF), dimethylene glycol dimethyl ether and the like; ketones such as acetone, methylethyl ketone (MEK), methyl-isopropyl ketone, methyl-isobutyl ketone (MIBK) and the like; nitriles such as acetonitrile, propionitrile and the like; esters such as ethyl acetate, amyl acetate and the like, acid amides such as dimethyl formamide (DMF), dimethyl acetamide (DMA), N-methylpyrrolidone, 1,3-dimethyl-2-imidazolidinone, hexamethylphosphoric traimide (HMPA) and the like; sulfones and sulfoxides such as dimethyl sulfoxide (DMSO), sulfolane and the like; and base such as pyridine.

In the above mentioned process (b), the reaction temperature can be varied within a substantially wide range. In general, the reaction is carried out at a temperature of from about -120 °C to about 200 °C, preferably from 20 °C to about 100 °C.

Further, the reaction is carried out under normal pressure, although it is also possible to employ a higher or reduced pressure.

When the above mentioned process (b) according to the present invention is carried out, use is made, for example, of about 1 to 3 moles of the compound of the formula (V) in a diluent such as acetonitrile per 1 mole of the compounds represented by the general formula (IV) to obtain the desired compounds.

The reaction of the above production method (c) can be carried out in an appropriate diluent, for example, an optional inert organic solvent. Examples of such organic solvents are: aliphatic, alicyclic or aromatic hydrocarbons (which may be optionally chlorinated), such as pentane, hexane, cyclohexane, petroleum ether, ligroin, benzene, toluene, xylene, dichloromethane, chloroform, carbon tetrachloride, 1,2-dichloroethane, chlorobenzene and dichlorobenzene; ethers such as ethyl ether, methyl ethyl ether, isopropyl ether, butyl ether, dioxane, dimethoxyethane (DME), tetrahydrofuran (THF) and diethylene glycol dimethyl ether (DGM); ketones such as acetone, methyl ethyl ketone (MEK), methyl-isopropyl ketone and methyl isobutyl ketone (MIBK); nitriles such as acetonitrile, propionitrile and acrylonitrile; esters such as ethyl acetate and amyl acetate; acid amides such as dimethylformamide (DMF), dimethylacetamide (DMA), N-methylpyrrolidone, 1,3-dimethyl-2-imidazolidinone and hexamethylphosphoric triamide (HMPA); and sulfones and sulfoxides such as dimethyl sulfoxide (DMSO) and sulfolan.

The production method (c) can also be carried out in the presence of an acid binding agent. Examples of usable acid binding agents are as follows: inorganic bases, for example, hydroxides, carbonates and bicarbonates of alkali metals or alkaline earth metals, such as sodium hydrogencarbonate, potassium hydrogencarbonate, sodium carbonate, potassium carbonate, lithium hydroxide, sodium hydroxide, potassium hydroxide and calcium hydroxide; organic bases, for example, tertiary amines, N,N-dialkylanilines and pyridines, such as triethylamine, 1,1,4,4-tetramethylethylenediamine (TMEDA), N,N-dimethylaniline, N,N-diethylaniline, pyridine, 4-dimethylaminopyridine (DMAP), 1,4-diazabicyclo[2,2,2]octane (DABCO) and 1,8-diazabicyclo[5,4,0]undec-6-ene (DBU).

The reaction of the production method (c) can be conducted at a temperature within a substantially broad range, but it is generally possible to employ a reaction temperature of about -70 to about 150°C, preferably about -10 to about 80°C. Further, the reaction should preferably be conducted under normal pressure but it may optionally be operated under an elevated or reduced pressure.

For carrying out the production method (c), for instance, 1 mole of the compound of the formula (IV) can be reacted with 1 to 3 moles of the compound of the formula (VI) in a diluent such as dichloromethane and in the presence of a base such as 4-(N,N-dimethylamino)pyridine to thereby obtain the object compound of the formula (I).

In carrying out the process (d) mentioned above, use may be made, as suitable diluent, of any inert solvent. Examples of such diluents are aliphatic, cycloaliphatic and aromatic, optionally chlorinated, hydrocarbons such as pentane, hexane, cyclohexane, petroleum ether, ligroin, benzene, toluene, xylene, dichloromethane, chloroform, carbon tetrachloride, 1,2-dichloroethane, chlorobenzene, dichlorobenzene and the like; ethers such as diethyl ether, methyl ether, diisopropyl ether, dibutyl ether, dioxane, dimethoxyethane(DME), tetrahydrofurane (THF) dimethylene glycol dimethyl ether and the like; ketones such as acetone, methylethyl ketone (MEK), methyl-isopropyl ketone, methyl-isobutyl ketone (MIBK) and the like; nitriles such as acetonitrile, propionitrile and the like; esters such as ethyl acetate, amyl acetate and the like, acid amides such as dimethyl formamide (DMF), dimethyl acetamide (DMA), N-methylpyrrolidone, 1,3-dimethyl-2-imidazolidinone, hexamethylphosphoric traimide (HMPA) and the like; sulfones and sulfoxides such as dimethyl sulfoxide (DMSO), sulfolane and the like; and base such as pyridine.

The process (d) according to the invention is carried out preferably in the presence of an acid binder. As example of such acid binder may be mentioned: inorganic bases including hydroxide, carbonate, bicarbonate of alkali metals and alkali earth metals such as, for example, sodium hydrogencarbonate, potassium hydrogencarbonate, sodium carbonate, potassium carbonate, and the like, inorganic alkali metal amide including lithium amide, sodium amide, potassium amide, and the like, organic bases including alkorate, tertiary amines, N,N-dialkylanilines, and pyridines such as, for example, triethylamine, tributylamine, 1,1,4,4-tetramethylenediamine (TMEDA), N,N-dimethylaniline, N,N-diethlaniline, pyridine, 4-dimethylaminopyridine (DMAP), 1,4-diaza-bicyclo-[2,2,2]octane (DABCO), 1,8-diazabicyclo[5,4,0]-undec-7-ene (DBU) and the like.

In the above mentioned process (d), the reaction temperature can be varied within a substantially wide range. In general, the reaction is carried out at a temperature of from about -70°C about 150°C, preferably from -10°C to about 100°C. Further, the reaction is carried out under normal pressure, although it is also possible to employ a higher or reduced pressure.

45

50

When the above mentioned process (d) according to the present invention is carried out, use is made, for example, about 1 to 5 moles of the compound of the formula (VIII), in diluent such as tetrahydrofurane and in the presence of an acid binder, such as sodium hydrogencarbonate, per 1 mole of the compounds represented by the general formula (VII) to obtain the desired compounds.

The reaction of the above production methods (e) and (f) can be carried out in an appropriate diluent. As such diluents, there may be mentioned water and optional inert organic solvents, for example, aliphatic, alicyclic or aromatic hydrocarbons (which may be optionally chlorinated) such as pentane, hexane, cyclohexane, petroleum ether, ligroin, benzene, toluene, xylene, dichloromethane, chloroform, carbon tetrachloride, 1,2-dichloroethane, chlorobenzene and dichlorobenzene; ethers such as ethyl ether, methyl ethyl ether, isopropyl ether, butyl ether, dioxane, dimethoxyethane

(DME), tetrahydrofuran (THF) and diethylene glycol dimethyl ether (DGM); nitriles such as acetonitrile, propionitrile and acrylonitrile; and alcohols such as methanol, ethanol, isopropanol, butanol and ethylene glycol.

The reaction of the production method (e) can be conducted at a temperature within a substantially broad range, but it is generally possible to employ a reaction temperature of about -30°C to about 150°C, preferably about -20°C to about 100°C. Furthermore, the reaction should preferably be conducted under normal pressure but it may optionally be operated under an elevated or reduced pressure.

For carrying out the production method (e), for instance, 1 mole of the compound of the formula (IX) can be reacted with 1 to 10 moles of an oxidizing agent in a diluent such as methanol to thereby obtain the object compound of the formula (I).

The production method (f) can be conducted at a temperature within a substantially broad range, but it is generally possible to employ a reaction temperature of about -70°C to about 150°C, preferably about -10°C to about 100°C. Further, the reaction should preferably be conducted under normal pressure but it may optionally be operated under an elevated or reduced pressure.

For carrying out the production method (f), for instance, 1 mole of the compound of the formula (X) can be reacted with 1 to 3 moles of an oxidizing agent in a diluent such as dichloromethane to thereby obtain the object compound of the formula (I).

Further, the compounds of the formula (I), according to the invention can be used for combating a broad range of various pests, particularly injurious sucking insects, biting insects and other plantparasitic pests as well as pests of stored cereals and hygiene pests, and can be used as insecticides for combating them.

Examples of such pests are as follows:

As insects, there may be mentioned pests from the order of the Coleoptera, for example, Callosobruchus chinensis, Sitophilus zeamais, Tribolium castaneum, Epilachna vigintioctomaculata, Agriotes fuscicollis, Anomala rufocuprea, Leptinotrarsa decemlineata, Diabrotica spp., Monochamus alternatus, Lissorhoptrus oryzophihus and Lyctus bruneus; pests from the order of the Lepidoptera, for example, Lymantria dispar, Malacosoma neustria, Pieris rapae, Spodoptera litura, Mamestra brassicae, Chilo suppressalis, Pyrausta nubilalis, Ephestia cautella, Adoxophyes orana, Carpocapsa pomonella, Agrotis fucosa, Galleria mellonella, Plutella xylostella, Heliothis virescens and Phyllocnistis citrella; pests from the order of the Hemiptera, for example, Nephotettix cincticeps, Nilaparvata lugens, Pseudococcus comstocki, Unaspis yanonensis, Myzus persicase, Aphis pomi, Aphis gossypii, Lipaphis erysimi, Stephanitis nashi, Nezara

spp., Cimex lectularius, Trialeurodes vaporariorum and Psylla spp.;
pests from the order of the Orthoptera, for example, Blattela germanica, Periplaneta americana, Gryllotralpa africana and Locusta migratoria migratoriodes;

pests from the order of the Isoptera, for example, *Deucotermes speratus* and *Coptotermes formosanus*; and pests from the order of the Diptera, for example, *Musca domestica*, *Aedes aegypti, Hylemia platura, Culex pipiens, Anopheles sinensis* and *Culex tritaeniorhynchus*.

As mites, there may be mentioned, for example, Tetranychus kanzawai, Tetranychus urticae, panonychus citri, Aculops pelekassi and Tarsonemus spp.

As nematodes, there may be mentioned, for example, Meloidogyne incognita, Bursaphelenchus xylophilus, Aphelenchoides besseyi, Heterodera glycines and Pratylenchus spp.

Further, in the pharmaceutical field of veterinary medicine, the novel compounds according to the invention are effective against various injurious animal parasites (endoparasites and ectoparasites), such as insects and helminths. Examples of such animal parasites include the following pests:

As insects, there may be mentioned, for example, Gastrophilus spp., Stomoxys spp., Trichodectes spp., Rhodnius spp. and Ctenocephalides spp.

As mites, there may be mentioned, for example, Ornithodoros spp., Ixodes spp. and Boophilus spp.

In this specification, the "insecticide(s)" is a generic term for substances having combating action against all the pests as mentioned above.

In the case of the use as insecticides, the active compounds of the formula (I) can be converted into customary formulations, such as solutions, wettable powders, suspensions, powders, foams, pastes, tablets, granules, aerosols, natural and synthetic materials impregnated with active compounds, very fine capsules in polymeric substances and in coating compositions for seed, furthermore in formulations used with buring equipment, such as fumigating cartridges, fumigating cans and fumigating coils and the like, as well as ULV cold- and warm-mist formulations.

These formulations are produced in the manner known per se, for example, by mixing the active compounds with extenders, that is liquid solvents, liquefied gases under pressure and/or solid carriers, optionally with the use of surface-active agents, that is emulsifying agents and/or dispersing agents and/or foam-forming agents. Use of a surface-active agent is preferred.

As liquid solvents or carriers, there are suitable in the main: aromatic hydrocarbons, such as xylene, toluene or alkyl naphthalenes; chlorinated aromatic hydrocarbons and chlorinated aliphatic hydrocarbons, such as chlorobenzenes, chloroethylenes or methylene chloride; aliphatic hydrocarbons, such as cyclohexane or paraffins, for example mineral oil fractions, alcohols, such as butanol or glycol as well as their ethers and esters, ketones, such as acetone, methyl

ethyl ketone, methyl isobutyl ketone or cyclohexanone; strongly polar solvents, such as dimethyl-formamide and dimethylsulfoxide; as well as water. In the case of the use of water as an liquid solvent or carrier, organic solvents can be used as auxiliary solvents.

By liquefied gaseous diluents or carriers there are meant liquids which are gaseous at normal temperature and under atmospheric pressure, for example aerosol propellants, such as butane, propane, nitrogen, carbon dioxide and halogeno-hydrocarbons.

As solid diluents or carriers there are suitable: for example, ground natural minerals, such as kaolins, clays, talc, chalk, quartz, attapulgite, montmorillonite or diatomaceous earth, and ground synthetic minerals, such as highly-dispersed silicic acid, alumina and silicates.

As solid carriers for granules there are suitable: for example, crushed and fractionated natural rocks such as calcite, marble, pumice, sepiolite and dolomite, as well as synthetic granules of inorganic and organic meals, and granules of organic material such as sawdust, coconut shells, maize cobs and tobacco stalks.

As emulsifying and/or foam-forming agents there are suitable: for example non-ionic and anionic emulsifiers, such as polyoxy-ethylene-fatty acid esters, polyoxyethylene-fatty alcohol ethers, for example alkylaryl polyglycol ethers, alkyl-sulfonates, alkyl-sulfates, arylsulfonates as well as albumin hydrolysation products.

As dispersing agents there are suitable: for example lignin-sulphite waste liquors and methylcellulose.

Adhesives may also be used in formulations such as powders, granules and emulsions, and the followings are to be mentioned as examples of usable adhesives: for example carboxymethylcellulose and natural and synthetic polymers such as gum arabic, polyvinyl alcohol and polyvinyl acetate.

It is possible to use colorants such as inorganic pigments, for example iron oxide, titanium oxide and Prussian Blue, and organic dyestuffs, such as alizarin dyestuffs, azo dyestuffs and metal phthalocyanine dyestuffs, and trace nutrients such as salts of metals, for example iron, manganese, boron, copper, cobalt, molybdenum and zinc.

The formulations in general can contain between 0.1 and 95 per cent by weight, preferably between 0.5 and 90% by weight of the above active compound.

The active compounds of the formula (I), according to the invention, can be present in their commercially available formulations and the use forms prepared with these formulations as a mixture with other active compounds, such as insecticides, attractants, sterilants, miticides, nematocides, fungicides, growth-regulating substances or herbicides. The above insecticides include, for example, organic phosphate, carbamates, carboxylates, chlorinated hydrocarbons and insecticidal substances produced by microorganisms.

The active compounds of the formula (I), according to the invention, can further be present as a mixture with synergistic agents. Synergistic agents are compounds which increase the action of the active compounds, without it being necessary for the synergistic agent added to be active itself.

The content of the active compounds of the formula (I), according to the invention, in their use form can be varied within wide limits. The concentration of the active compounds of the formula (I) according to the invention in their use form can generally be from 0.0000001 to 100 per cent by weight, preferably between 0.00001 and 1 per cent by weight.

The compounds of the formula (I), according to the invention, can be employed in a customary manner appropriate for the use forms, for example, by spraying and by scattering. The compounds of formula (I) can be applied for the treatment of soil and of leaves. They also show activity after systemic translocation. Further, the active compounds according to the invention have a good stability to alkali on limed substances and excellent residual action on wood and soil. Thus, they are extremely effective for combating hygiene pests and pests of stored cereals.

Then, the following Examples illustrates the invention, but they should not be regarded as limiting the scope of the invention.

#### Synthesis Example 1

45

10

20

25

30

35

55

50

An ethanol solution (50 ml) of 4-chloro-4'-methylmercaptomethylbenzophenone (9.3 g), hydrazine hydrate (6 ml) and acetic acid (3 ml) was heated for 20 hours with refluxing. The solvent was distilled off under reduced pressure, and then the obtained oily substance was diluted with dichloromethane and washed successively with an aqueous 5% sodium hydroxide solution, water and an aqueous saturated sodium chloride solution, followed by drying over anhydrous mag-

nesium sulfate. The solvent was then distilled off to obtain 4-chloro-4'-methylmercaptomethylbenzophenone hydrazone (7.1 g) as an isomer mixture (syn form/anti form = about 1:1).  $n_D^{20}$  1.6350

#### 5 Synthesis Example 2

 $\begin{array}{c} O \\ N - NH - C - O - C_2H_5 \\ C \\ C \\ CH_2 - S - CH_3 \end{array}$ 

An ethanol solution (100 ml) of 4-fluoro-4'-methylmercaptomethylbenzophenone (7.8 g), ethyl carbazate (9.4 g) and acetic acid (9 ml) was heated for 20 hours with refluxing. The solvent was distilled off under reduced pressure, and then the obtained oily substance was diluted with dichloromethane, and washed successively with an aqueous 5% sodium hydroxide solution, water and an aqueous saturated sodium chloride solution, followed by drying over anhydrous magnesium sulfate. The solvent was then distilled off to obtain 4-fluoro-4'-methylmercaptomethylbenzophenone ethoxycar-bonylhydrazone (6.4 g) as an isomer mixture.

### Synthesis Example 3

An ethanol solution (100 ml) of 4-chloro-4'-methylsulfinylmethyl benzophenone (5.8 g), ethyl carbazate (6.3 g) and pyridinium p-toluenesulfonate (0.1 g) was heated for 6 hours with refluxing. After cooling to a room temperature, the reaction mixture was poured into ice-water, and the precipitated crystals were collected by filtration, and washed successively with an aqueous sodium bicarbonate solution and water. After air-drying, 4-chloro-4'-methylsulfinylmethylbenzophenone ethoxycarbonylhydrazone (6.4 g) was obtained as an isomer mixture.

melting point: 65 - 70°C

A reaction was conducted in the same manner as in Synthesis Example 3 except that 4-chloro-4'-methylsulfonyl-methylbenzophenone (6.2 g) was used instead of 4-chloro-4'-methylsulfinylmethylbenzophenone to thereby obtain 4-chloro-4'-methylsulfonylmethylbenzophenone ethoxycarbonylhydrazone (6.7 g) as an isomer mixture. melting point: 166 - 169°C

55

#### Synthesis Example 4

5

10

An ethanol solution (100 ml) of 4-chloro-4'-methylmercaptomethylbenzophenone (8.3 g), ethyl carbazate (10 g) and pyridinium p-toluenesulfonate (0.1 g) was heated for 16 hours with refluxing. After cooling to a room temperature, the reaction mixture was poured into ice water, and then the precipitated crystals were collected by filtration, and washed with water. After air-drying, 4-chloro-4'-methylmercaptomethylbenzophenone ethoxycarbonylhydrazone (9.4 g) was obtained as an isomer mixture.

melting point: 105 - 109°C

This mixture (1.0 g) was purified by silica gel column chromatography (developing solvent: n-hexane:ethyl acetate = 9:1) to obtain 0.24 g of Isomer A having a melting point of 106 - 107°C from the first eluate portion and 0.56 g of Isomer B having a melting point of 117 - 120°C from the second eluate portion.

#### Synthesis Example 5

30

35

To a dichloromethane solution (30 ml) of 4-chloro-4'-methylmercaptomethylbenzophenone hydrazone (1.5 g) and 4-40 (N,N-dimethylamino)pyridine (1.2 g), isobutyl chlorocarbonate (0.8 g) was dropwise added under cooling with ice and subsequently stirred at a room temperature for 20 hours. The reaction mixture was then successively washed with 2N hydrochloric acid, water and an aqueous saturated sodium chloride solution, and dried over anhydrous magnesium sulfate. After distilling off the solvent, the crude product was purified by silica gel column chromatography (developing solvent: ethyl acetate:n-hexane = 1:4) to obtain 4-chloro-4'-methylmercaptomethylbenzophenone isobutoxycarbonyl hydrazone (0.5 g) as an isomer mixture.

50

#### Synthesis Example 6

5

10

To a acetonitrile solution (10 ml) of 4-chloro-4'-methylmercaptomethylbenzophenone (0.5 g), 4-trifluoromethoxyphenyl isocyanate (0.3 g) was added and stirred at a room temperature for 10 hours. After the soluvent was distilled off under reduced pressure, the resdue was recrystallized from ethanol to obtain 4-chloro-4'-methylmercaptomethylbenzophenone4-(4-trifluoromethoxyphenyl)-semi-carbazone (0.5 g).

melting point: 179 - 183 °C

### Synthesis Example 7

25

20

30

To a dimethylformamide solution (10 ml) of 4-chloro-4'-methylmercaptomethylbenzophenone ethoxycarbonylhydrazone (3.6 g), sodiumuhydride-60% oil suspension (0.4 g) was added under an argon atmosphere and stirred at a room temperature untill the evolution of hydrogen gas ceased.

And then methyl iodide (3 g) was added and stirred at room temperature for 16 hours. After the reaction mixture was poured into ice-water, ethyl acetate was added thereto. Then the organic layer was separated, and washed successively with an aqueous 2 N hydrochloric acid solution, water and aqueous saturated sodium chloride solution, followed by drying over anhydrous sodium sulfate. After distilling off the solvent, the obtained crude product was purified by silca gel colum chromatography (developing solvent n-hexane:ethyl acetate = 5:1) to obtain 4-chloro-4'-methylmercaptomethylbenzophenone N'-ethoxycarbonyl-N'-methylhydrazone (1.5 g). n<sub>D</sub><sup>20</sup> 1.6039

45

The following Table 7 shows the compounds synthesized in the above Synthesis Examples 1 to 7 together with the compounds synthesized in the same manner as those in the Synthesis Examples 1 to 7. Compounds of Nos. 1 to 30, and 33 to 216 are isomer mixtures (anti form/syn form). Compound Nos. 31 and 32 are pure isomers.

50

| 5        |         |          |     |                  | melting point or              | refractive index<br>n <sup>20</sup> = 1 6890 | $n_D^{20} = 1.6350$ | 45 - 51 °C | 124 - 130 °C    | $n_0^{20} = 1.5972$                           | $n_D^{20} = 1.6032^{'}$                       | $n_D^{20} = 1.6186$                           | 98 - 103 °C                                   | $n_0^{20} = 1.5984$ | 125 - 135 °C |
|----------|---------|----------|-----|------------------|-------------------------------|--|---------------------|------------|-----------------|---|---|---|---|---------------------|--------------|
| 10       |         |          |     |                  | 7                             | X I  | I                   | I          | I               | I   | I   | I   | I   | I                   | I            |
| 15       |         |          |     |                  | ن د                           | Y  | I                   | r          | I               | I   | I   | I   | I   | r                   | I            |
| 20<br>25 | Table 7 |          |     | , S(O)n — R³<br> | <u>0</u><br>ئ                 | I  | I                   | r          | I               | сн2осн3                                       | CH <sub>2</sub> SCH <sub>3</sub>              | CH <sub>3</sub>                               | I   | сн2осн3             | I            |
| 30       | Ta      | Zw<br>Zw | Z=O |                  | 4                             | H  | I                   | I          | I               | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | со2сн3              | со2сн3       |
| 35       |         |          |     | =\_<br>          | c                             | 0  | 0                   | -          | 2               | 0   | 0   | 0   | 0   | 0                   |              |
| 40       | •       |          |     |                  | ę,                            | CH <sub>3</sub>                              | CH <sub>3</sub>     | СН3        | CH <sub>3</sub> | CH <sub>3</sub>                               | CH3   | СН3   | GH <sub>3</sub>                               | CH <sub>3</sub>     | cH3          |
| 45       |         |          |     |                  | 75<br>25                      | I  | I                   | I          | I               | I   | I   | I   | r   | I                   | I            |
| 50       |         |          |     |                  | Compound<br>No R <sup>1</sup> |  | 7<br>7              | 3<br>C     | 4<br>Ω          | 5 Br  | 6 Br  | 7 Br  | 8 Br  | 9 Br                | 10 Br        |

| 5  |   |                     | melting point or | refractive index | $n_D^{20} = 1.6267$             | $n_{\rm D}^{20} = 1.5824$                     | $n_D^{20} = 1.5941$                           | 28 - 63 °C | 179 - 183 °C | $n_0^{20} = 1.5763$                           | $n_D^{20} = 1.5773$                            | $n_{\rm D}^{20} = 1.5903$                     | $n_D^{20} = 1.6088$                           | $n_D^{20} = 1.6039$                           | $n_D^{20} = 1.5824$                           | $n_D^{20} = 1.5872$                           | $n_{\rm D}^{20} = 1.5740$                     | $n_D^{20} = 1.5830$                           |
|----|---|---------------------|------------------|------------------|---------------------------------|---|---|------------|--------------|---|--|---|---|---|---|---|---|---|
| 10 |   |                     |                  | R,               | r                               | I   | I   | I          | I            | ı   | I  | I   | r   | I   | r   | I   | I   | I   |
| 15 |   |                     |                  | Re               | I                               | I   | I   | I          | I            | r   | I  | I   | I   | I   | I   | r   | I   | I   |
| 20 |   | ned)                |                  | R <sup>5</sup>   | I                               | I   | I   | I          | I            | CH2CO2C2H5                                    | CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub> | сн2осн3                                       | сн28сн3                                       | cH <sub>3</sub>                               | OHF <sub>2</sub>                              | OH3   | COC <sub>3</sub> H <sub>7</sub> -iso          | coc <sub>3</sub> H <sub>7</sub> -n            |
| 25 |   | Table 7 (continued) |                  |                  |                                 |   |   |            | -            |   |  | -   |   | •   | J   |   | Ŭ   | J   |
| 30 |   | Table               |                  | R⁴               | CO <sub>2</sub> CH <sub>3</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | со2сн3     | со2сн3       | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub>  | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
| 35 |   |                     |                  | د                | 0                               | 0   | 0   | -          | 7            | 0   | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   |
| 40 | • |                     |                  | R³               | C <sub>2</sub> H <sub>5</sub>   | CH <sub>2</sub> CF <sub>3</sub>               | CH2CHF2                                       | £          | £,           | H<br>H  | S.<br>F.                                       | Н   | g.  | GH <sub>3</sub>                               | СН³   | CH,   | CH³   | CH <sub>3</sub>                               |
| 45 |   |                     |                  | R <sup>2</sup>   | I                               | I   | I   | I          | I            | I   | I  | I   | I   | I   | r   | I   | I   | I   |
|    |   |                     |                  | æ                | ğ                               | ă   | ă   | ă          | ğ            | ਹ   | ប  | ਹ   | ច   | ប   | ច   | ច   | ប៊  | ច   |
| 50 |   |                     | Compound         | No.              | 11                              | 12  | 13  | 41         | 15           | 16  | 17   | 18  | 19  | 20  | 21  | 22  | 23  | 24  |

| 5        |                     | melting point or refractive index | n <sub>D</sub> = 1.5996 | $n_{\rm D}^{20} = 1.6036$                     | $n_D^{20} = 1.6175$                           | $n_D^{20} = 1.6318$                           | $n_D^{20} = 1.6015$                           | 105 - 109 °C                                  | 106 - 107 °C                                  | 117 - 120 °C                                  | 105 -106.5 °C                                 | $n_D^{20} = 1.5872$                           | $n_0^{20} = 1.5954$                             | $n_D^{20} = 1.6229$ | 98 - 101 °C | $n_D^{20} = 1.6029$              | 136 - 140 °C    | 38.5 - 147.5 °C    | 115 - 119 °C                                       |
|----------|---------------------|-----------------------------------|-------------------------|---|---|---|---|---|---|---|---|---|---|---------------------|-------------|----------------------------------|-----------------|--------------------|--|
| 10       |                     | Α,                                | I                       | I   | I   | I   | I   | I   | I   | I   | r   | I   | x   | I                   | I           | r                                | I               | r                  | I  |
| 15       |                     | α                                 | I                       | r   | I   | I   | I   | r   | I   | I   | ·I  | I   | I   | I                   | I           | I                                | r               | r                  | I  |
| 20<br>25 | ontinued)           | RŞ                                | 0=0-                    | - C \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \       | , SH,200                                      | COCH=CHC <sub>6</sub> H <sub>5</sub>          | сосн  | I   | I   | I   | r   | n-C <sub>3</sub> H <sub>7</sub>               | I   | I                   | I           | сн <sub>2</sub> осн <sub>3</sub> | I               | I                  | I  |
| 30       | Table 7 (continued) | R4                                | со2с2Н5                 | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> CH <sub>2</sub> CF <sub>3</sub> | CO2CH2CH=CH2        | CO2CH2CH2CI | со2сн3                           | со2сн3          | со2сн3             | CO <sub>2</sub> C <sub>3</sub> H <sub>7</sub> -iso |
| 35       |                     | c                                 | 0                       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | •   | 0   | 0                   | 0           | 0                                | 0               | 0                  | 0  |
| 40       | ~                   | R <sup>3</sup>                    | CH <sub>3</sub>         | cH <sub>3</sub>                               | CH <sub>3</sub>                               | CH <sub>3</sub>                               | cH <sub>3</sub>                               | cH <sub>3</sub>                               | GH <sub>3</sub>                               | СН3   | CH <sub>2</sub> CN                            | сн³   | CH <sub>3</sub>                                 | снз                 | снз         | cH <sub>3</sub>                  | cH <sub>3</sub> | CH <sub>2</sub> CN | CH <sup>3</sup>                                    |
| 45       |                     | R <sup>2</sup>                    | r                       | I   | I   | I   | r   | I   | I   | I   | I   | I   | r   | I                   | I           | r                                | r               | I                  | I  |
|          |                     | œ                                 | ਹ                       | ប   | ច   | ច   | ប   | ਹ   | ប   | ਹ   | ច   | ប   | ច   | ਹ                   | ਹ           | ਹ                                | ច               | ច                  | ច  |
| 50       |                     | Compound<br>No.                   | 25                      | 26  | 27  | 28  | 29  | 30  | 31  | 32  | 33  | 34  | 35  | 36                  | 37          | 38                               | 39              | 40                 | 4  |

| 5  |                     | melting point or | $n_{\rm c}^{20} = 1.6103$                          | 94 - 98 °C                                       | 79 - 83 °C                                       | 3° 68 - 88  | 63.5 - 66.5 °C                                    | 52 - 55 °C  | 124 - 125 °C | $_3 n_D^{20} = 1.6147$                        | 77 - 78.5 °C                                  | $n_D^{20} = 1.5732$                             | 87 - 92 °C | 125 -127 °C                                   | $n_D^{20} = 1.6267$                | 70 - 71 °C                                    | 98 - 101 °C                      | $n_D^{20} = 1.5908$                           | $n_0^{20} = 1.5772$                           | 118 - 124 °C                                  | 127 - 137 °C                    | $n_D^{20} = 1.5838$                           | $n_D^{20} = 1.5603$             |
|----|---------------------|------------------|--|--|--|---|---|---|--------------|---|---|---|------------|---|------------------------------------|---|----------------------------------|---|---|---|---------------------------------|---|---------------------------------|
| 10 |                     | ۵,               | I  | I  | I  | I   | I   | I   | 3-Br         | 3-CH <sub>3</sub>                             | I   | I   | I          | I   | I                                  | I   | I                                | I   | I   | I   | I                               | I   | I                               |
| 15 |                     | œ<br>Oz          | I  | I  | I  | I   | I   | I   | I            | I   | Ι   | I   | Ι          | I   | I                                  | I   | I                                | I   | I   | Ι   | I                               | I   | I                               |
| 20 | -                   |                  |  |  |  |   |   |   |              |   |   |   |            |   |                                    |   |                                  |   |   |   |                                 |   |                                 |
| 25 | Table 7 (continued) | å                | I  | I  | I  | I   | I   | I   | I            | I   | r   | I   | I          | I   | I                                  | I   | I                                | I   | I   | I   | r                               | I   | I                               |
| 30 | Table               | <u>ب</u>         | CO <sub>2</sub> C <sub>4</sub> H <sub>g</sub> -iso | CO <sub>2</sub> C <sub>3</sub> H <sub>7</sub> -n | CO <sub>2</sub> C <sub>4</sub> H <sub>9</sub> -n | CO <sub>2</sub> C <sub>5</sub> H <sub>11</sub> -n | CO <sub>2</sub> C <sub>6</sub> H <sub>13</sub> -n | CO <sub>2</sub> C <sub>4</sub> H <sub>9</sub> -tert | $CO_2C_2H_5$ | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> CH <sub>2</sub> CF <sub>3</sub> | со2сн3     | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | , co <sub>2</sub> cH <sub>3</sub>  | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | со2сн3                           | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> CH <sub>3</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> CH <sub>3</sub> |
| 35 |                     | <b>c</b>         | 0  | 0  | 0  | 0   | 0   | 0   | 0            | 0   | 0   | 0   | 0          | 0   | 0                                  | 0   | 0                                | 0   | 0   | 0   | 0                               | 0   | 0                               |
| 40 | *                   | R³               | CH <sub>3</sub>                                    | CH <sub>3</sub>                                  | cH <sub>3</sub>                                  | c <sub>H</sub>                                    | cH <sub>3</sub>                                   | CH <sub>3</sub>                                     | сну          | снз   | $C_2H_5$                                      | C <sub>2</sub> H <sub>5</sub>                   | $C_2H_5$   | $C_3H_7$ -iso                                 | C <sub>3</sub> H <sub>7</sub> -iso | C <sub>3</sub> H <sub>7</sub> -n              | C <sub>3</sub> H <sub>7</sub> -n | C <sub>4</sub> H <sub>9</sub> -n              | CF <sub>3</sub>                               | СН2С≡СН                                       | CH <sub>2</sub> C≡ CH           | CH <sub>2</sub> CF <sub>3</sub>               | CH <sub>2</sub> CF <sub>3</sub> |
| 45 |                     | R <sup>2</sup>   | I  | I  | I  | I   | I   | I   | I            | I   | I   | I   | I          | I   | I                                  | r   | I                                | I   | I   | I   | I                               | I   | I                               |
|    |                     | <u>,</u>         | ច  | ប  | ប  | ັວ  | ರ   | ប   | ਹ            | ਠ   | ប   | ਹ   | ฉ          | ច   | ច                                  | ច   | $\bar{o}$                        | ច   | ᇹ   | ច   | ច                               | ច   | ច                               |
| 50 |                     | Compound<br>No.  | 42   | 43   | 44   | 45  | 46  | 47  | 48           | 49  | 90  | 51  | 52         | 53  | 54                                 | 22  | 26                               | 22  | 58  | 59  | 09                              | 61  | 62                              |

| 5  | ·                   | melting point or | refractive index | J. 62 - 22  |         | ن :                             | 67 - 81 °C                         | $n_D^{20} = 1.5762$                           | $n_D^{20} = 1.5838$              | 85 - 88.5 °C                                  | 85 - 88 °C       | 0° 07 - 69      | 60 - 75 °C                      | $n_D^{20} = 1.5835$                           | 69.5 - 72 °C                     | 64.5 - 72 °C                                  | 2° 69 - 75                                    | amorphous                       | 166 - 169 °C                                  | 205 - 208 °C | 190 - 193 °C              | 93 - 95 °C                                    | 70 - 78 °C | $n_{\rm D}^{20} = 1.5930$          | 131 - 138 °C                     | 147 - 149 °C                                  | $n_D^{20} = 1.6205$                           |
|----|---------------------|------------------|------------------|-------------|---------|---------------------------------|------------------------------------|---|----------------------------------|---|------------------|-----------------|---------------------------------|---|----------------------------------|---|---|---------------------------------|---|--------------|---------------------------|---|------------|------------------------------------|----------------------------------|---|---|
| 10 |                     |                  | ω,               | I           | I       | I                               | I                                  | I   | I                                | I   | I                | I               | I                               | I   | I                                | I   | I   | I                               | r   | I            | I                         | I   | I          | I                                  | I                                | r   | I   |
| 15 |                     |                  | å                | I           | I       | Ι                               | I                                  | I   | I                                | I   | I                | I               | I                               | I   | I                                | I   | I   | I                               | I   | I            | I                         | I   | I          | I                                  | I                                | I   | I   |
|    |                     |                  |                  |             |         |                                 |                                    |   |                                  |   |                  |                 |                                 |   |                                  |   |   |                                 |   |              |                           |   |            |                                    |                                  |   |   |
| 20 |                     |                  |                  |             |         |                                 |                                    |   |                                  |   |                  |                 |                                 |   |                                  |   |   |                                 |   |              |                           |   |            |                                    |                                  |   |   |
| 25 | Table 7 (continued) |                  | R <sub>5</sub>   | Ι           | I       | I                               | I                                  | I   | I                                | Ι   | r                | r               | I                               | I   | I                                | I   | r   | I                               | I   | I            | I                         | r   | I          | I                                  | I                                | I   | I   |
| 30 | Table               |                  | R4               | CO2C2H5     | CO2C2H5 | CO <sub>2</sub> CH <sub>3</sub> | CO2C2Hs                            | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | со2сн3                           | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO2CH3           | $CO_2C_2H_5$    | CO <sub>2</sub> CH <sub>3</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | согснз                           | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> CH <sub>3</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | со2сн3       | CO <sub>2</sub> C₄H₃-tert | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | со2сн3     | CO <sub>2</sub> CH <sub>3</sub>    | CO <sub>2</sub> CH <sub>3</sub>  | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
| 35 |                     |                  | _                | 0           | 0       | 0                               | 0                                  | 0   | 0                                | 0   | 0                | <del>-</del>    | _                               | -   | -                                | -   | <u>_</u>                                      | -                               | 7   | 7            | 7                         | 7   | 5          | 2                                  | 2                                | 2   | 0   |
| 40 | ÷                   |                  | R³               | CH2CH2CH2CI | CH2CH2F | CH2CH2F                         | CH <sub>2</sub> CH=CH <sub>2</sub> | CH2CHF2                                       | CH <sub>2</sub> CHF <sub>2</sub> | CHF <sub>2</sub>                              | CHF <sub>2</sub> | CH <sub>3</sub> | cH <sub>3</sub>                 | C <sub>2</sub> H <sub>5</sub>                 | C <sub>3</sub> H <sub>7</sub> -n | CH <sub>2</sub> CF <sub>3</sub>               | CHF <sub>2</sub>                              | CHF <sub>2</sub>                | cH <sub>3</sub>                               | £<br>F       | CH <sub>3</sub>           | $C_2H_5$                                      | $C_2H_5$   | C <sub>3</sub> H <sub>7</sub> -iso | C <sub>3</sub> H <sub>7</sub> -n | CH <sub>2</sub> CHF <sub>2</sub>              | CH <sub>3</sub>                               |
| 45 |                     |                  | μ <sub>2</sub>   | I           | r       | I                               | I                                  | I   | r                                | I   | I                | I               | I                               | r   | I                                | I   | I   | r                               | I   | I            | I                         | I   | I          | I                                  | I                                | I   | CH <sub>3</sub>                               |
|    |                     |                  | -K               | ច           | ö       | ਹ                               | ប                                  | ō   | ច                                | ਹ   | $\overline{0}$   | ច               | ប                               | ប   | ប៊                               | ច   | ច   | ਹ                               | ប៊  | ਹ            | ਹ                         | ច   | ប          | ರ                                  | ö                                | ರ   | ច   |
| 50 |                     | Compound         | No.              | 63          | 64      | 65                              | 99                                 | 29  | 99                               | 69  | 70               | 77              | 72                              | 73  | 74                               | 75  | 9/  | 7.1                             | 78  | 42           | 80                        | 81  | 82         | 83                                 | 84                               | 85  | 86  |

|    |                     | ō             | ×ı               |                     |   |   |   |   |   |            |   |   |   |   |              |              |              | •                     |                          |         |            |         |              |
|----|---------------------|---------------|------------------|---------------------|---|---|---|---|---|------------|---|---|---|---|--------------|--------------|--------------|-----------------------|--------------------------|---------|------------|---------|--------------|
| 5  |                     | melting point | refractive index | $n_0^{20} = 1.6032$ | 48 - 53 °C                                    | 115 - 117 °C                                  | $n_D^{20} = 1.6052$                           | $n_0^{20} = 1.5995$                           | 52 - 55 °C                                    | 61 - 64 °C | 135 - 143 °C                                  | $n_D^{20} = 1.6040$                           | $n_D^{20} = 1.5803$                           | _   | 124 - 128 °C | 103 - 113 °C | 100 - 104 °C | 50 - 55 °C            | 88 - 94 °C               |         | 7 +21 - 27 |         | 114 - 116 °C |
| 10 |                     |               | ٦,               | r                   | I   | I   | I   | I   | I   | I          | r   | I   | I   | I   | r            | I            | I            | I                     | I                        | =       | <b>C</b>   | :       | r            |
|    |                     |               | Re               | I                   | I   | I   | I   | I   | 2-CI  | 2-Cl       | 3-0   | I   | 3-F   | I   | I            | I            | I            | r                     | r                        | 3       | _          | į       | E            |
| 15 |                     |               |                  |                     |   |   |   |   |   |            |   |   |   |   |              |              |              |                       |                          |         |            |         |              |
| 20 |                     |               |                  |                     |   |   |   |   |   |            |   |   |   |   |              |              |              |                       |                          |         |            |         |              |
| 25 | Table 7 (continued) |               | R <sup>5</sup>   | I                   | I   | I   | I   | I   | I   | I          | I   | I   | I   | I   | I            | r            | I            | I                     | r                        | ב       | =          | :       | I            |
| 30 | Table 7 (           |               | R <sup>4</sup>   | со2сн3              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | со,сн3     | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | сосн         | COC2H5       | COC3H7-n     | COC₄H <sub>9</sub> -n | COC₄H <sub>9</sub> -tert | )<br>=o | -C-\\-\-Pi | )<br>=0 | -C-⟨-⟩-CH3   |
| 35 |                     |               | c                | 0                   | -   | 7   | 0   | 0   | 0   | 0          | 0   | 0   | 0   | 0   | 0            | 0            |              | 0                     | 0                        | c       | •          | c       | <br>D        |
| 40 | *                   |               | Р3               |                     |   |   |   |   |   |            |   |   |   |   |              |              |              |                       | cH <sub>3</sub>          | Ę       | <u>.</u>   |         | ຮົ້          |
| 45 |                     |               | R <sup>2</sup>   | CH3                 | S.<br>HJ                                      | CH3   | $C_2H_5$                                      | $n$ - $C_3H_7$                                | I   | I          | I   | I   | I   | I   | I            | I.           | I            | I                     | I                        | ı       | =          | :       | E            |
|    |                     |               | <u>~</u>         | ច                   | ប   | ਹ   | ប   | ರ   | ប   | ប          | ರ   | u_  | ц_  | _   | ਠ            | ច            | ប            | ರ                     | ਹ                        | 7       | 5          | ē       | 3            |
| 50 |                     | Compound      | No.              |                     |   |   |   |   |   |            |   |   |   |   |              |              |              |                       | 102                      | 103     | 2          | ,       | 5            |

| 5                      |                     | melting point or refractive index | 144 - 145 °C   | 126 - 130 °C                    | 100 - 103 °C  | 83 - 88 °C | 98 - 101 °C     | 140 - 145 °C                       | 121 - 131 °C    | 145 - 148 °C | 167 - 176 °C      | $n_D^{20} = 1.6080$               | 179 - 183 °C     | 126 - 135 °C ' | 169 - 172 °C      | $n_D^{20} = 1.6824$ | 186 - 189 °C                      | mixture of crystal<br>and oily substance      |
|------------------------|---------------------|-----------------------------------|----------------|---------------------------------|---------------|------------|-----------------|------------------------------------|-----------------|--------------|-------------------|-----------------------------------|------------------|----------------|-------------------|---------------------|-----------------------------------|---|
| 10                     |                     | ζ.                                | エ              | I                               | I             | I          | I               | x                                  | r               | I            | x                 | I                                 | I                | r              | I                 | I                   | I                                 | I   |
| . 15                   |                     | æ                                 | I              | r                               | Ţ             | I          | I               | I                                  | I               | I            | I                 | I                                 | I                | I              | I                 | r                   | I                                 | I   |
| 20                     |                     | 10                                |                |                                 |               |            |                 |                                    |                 |              |                   |                                   |                  |                |                   |                     |                                   |   |
|                        | inued)              | چ.                                | I              | I                               | I             | I          | I               | I                                  | I               | I            | I                 | I                                 | I                | I              | I                 | I                   | I                                 | I   |
| <i>25</i><br><i>30</i> | Table 7 (continued) | χ.                                | []<br>         | COC <sub>6</sub> H <sub>5</sub> | COCH2CH2CH2CI | coch2ch2cl | COCH2CH2CI      | COC <sub>3</sub> H <sub>7</sub> -n | COC3H7-n        |              | CONH <sub>2</sub> | CONHC <sub>2</sub> H <sub>5</sub> | -C·NH            | CONHCH2CH2CI   | CSNH <sub>2</sub> | -C·NH               | CONHC <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
| 35                     |                     | c                                 | 0              | 0                               | 0             | 0          | 0               | ₩-                                 | 7               | 0            | 0                 | 0                                 | 0                | 0              | 0                 | 0                   | 7                                 | 0   |
| 40                     | •,                  | R³                                | ٦.             | CH <sub>3</sub>                 | снз           | СН³        | CH <sub>3</sub> | CH <sub>3</sub>                    | CH <sub>3</sub> | CH3          | CH <sub>3</sub>   | CH <sub>3</sub>                   | c <sub>H</sub> 3 | CH3            | GF.               | CH3                 | CH <sub>3</sub>                   | sec-C <sub>4</sub> H <sub>9</sub>             |
| 45                     |                     | R <sup>2</sup>                    | I              | I                               | I             | I          | r               | I                                  | I               | I            | r                 | r                                 | I                | ı              | I                 | r                   | I                                 | r   |
|                        |                     | æ                                 | $\overline{o}$ | ច                               | ច             | ਹ          | ಠ               | ច                                  | $\overline{o}$  | ਹ            | ច                 | $\overline{o}$                    | $\overline{o}$   | ច              | ប                 | ರ                   | ច                                 | ō   |
| 50                     |                     | Compound<br>No.                   | 105            | 106                             | 107           | 108        | 109             | 110                                | 111             | 112          | 113               | 114                               | 115              | 116            | 117               | 118                 | 119                               | 120   |

EP 0 742 202 A2

| 5    |                     | melting point or refractive index | 121 - 122.5 °C | $n_D^{20} = 1.6543$ | $n_D^{20} = 1.6148$ | $n_0^{20} = 1.5799$               | $n_D^{20} = 1.6081$ | 144 - 146 °C  | $n_D^{20} = 1.6061$            | $n_D^{20} = 1.6195$ | $n_D^{20} = 1.6084$                           | 73 - 76 °C                                    | $n_D^{20} = 1.6250$                           | n <sub>D</sub> ° = 1.5939                     | n <sub>D</sub> <sup>20</sup> = 1.6139 |
|------|---------------------|-----------------------------------|----------------|---------------------|---------------------|-----------------------------------|---------------------|---|--------------------------------|---------------------|---|---|---|---|---------------------------------------|
| 10   |                     | R7                                | I              | I                   | I                   | I                                 | I                   | I   | I                              | I                   | x   | I.  | I   | I   | I                                     |
| . 15 |                     | ج<br>م                            | r              | Ι                   | r                   | Ι                                 | I                   | I   | I                              | I                   | 3-F   | 2-F   | I   | r   | r                                     |
| 20   | (pən                | ج<br>د<br>د                       | I              | I                   | I                   | iso-C <sub>3</sub> H <sub>7</sub> | I                   | I   | I                              | I                   | r   | I   | CH <sub>2</sub> C <sub>6</sub> H <sub>5</sub> | )<br>D=0                                      | Ę<br>Ł                                |
| 25   | Table 7 (continued) |                                   | ,              | ,                   | 10                  |                                   | ¢                   | )   | )C <sub>2</sub> H <sub>5</sub> | cH <sub>2</sub>     |   |   |   |   |                                       |
| 30   | Table               | ₽ <b>X</b>                        | CONH           | CONH                | COCH2CO2C2H5        | CO2C <sub>2</sub> H <sub>5</sub>  | )=-0<br>-0-0-0H     | CO <sub>2</sub> C <sub>5</sub> H <sub>11</sub> -neo | CO2CH2CH(CH3)C2H5              | CO2CH2C(CH3)=CH2    | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | COC <sub>3</sub> H <sub>7</sub> -n    |
| 35   |                     | ح                                 | 0              | 0                   | 0                   | 0                                 | 0                   | 0   | 0                              | 0                   | 0   | 0   | 0   | 0   | 0                                     |
| 40   | <del>.</del>        | R <sup>3</sup>                    | сн³            | cH <sub>3</sub>     | CH <sub>3</sub>     | cH <sub>3</sub>                   | СН3                 | СН3   | СН3                            | CH3                 | СН3   | CH <sub>3</sub>                               | СН3   | сн <sup>3</sup>                               | ಕ್ಟ                                   |
| 45   |                     | R <sup>2</sup>                    | I              | I                   | I                   | I                                 | I                   | I   | I                              | x                   | I   | I   | I   | I   | I                                     |
|      |                     | -α                                | ō              | ច                   | ਹ                   | ਹ                                 | $\bar{o}$           | ច   | ਠ                              | ច                   | ਹ   | ਠ   | ប៊  | ច   | ਹ                                     |
| 50   |                     | Compound<br>No.                   | 121            | 122                 | 123                 | 124                               | 125                 | 126   | 127                            | 128                 | 129   | 130   | 131   | 132   | 133                                   |

| 5  |   |                     | melting point or | refractive index | 69.5 - 77.5 °C                                | 147.5 - 154.5 °C                              | $n_D^{20} = 1.6233$ | 102 - 103 °C                                  | $n_D^{20} = 1.5935$ | $n_0^{20} = 1.5773$                | $n_0^{20} = 1.5927$                              | 93.5 - 101 °C                                      | 118 - 125.5 °C   | 159 - 161 °C                                  | amorphous        | 133.5 - 136 °C  | 172.5 - 180.5 °C                | $n_0^{20} = 1.6162$                              | $n_D^{20} = 1.5944$                                | 2° 56 - 98 | $n_0^{20} = 1.6282$             | $n_D^{20} = 1.5914$                                |    | n <sub>0</sub> = 1.5878 |
|----|---|---------------------|------------------|------------------|---|---|---------------------|---|---------------------|------------------------------------|--|--|------------------|---|------------------|-----------------|---------------------------------|--|--|------------|---------------------------------|--|----|-------------------------|
| 10 |   |                     |                  | Α,               | I   | r   | I                   | I   | I                   | I                                  | Ï  | I  | I                | I   | I                | I               | I                               | I  | I  | I          | I                               | I  |    | I                       |
| 15 |   |                     |                  | Re               | I   | I   | I                   | I   | I                   | I                                  | I  | I  | I                | I   | I                | I               | r                               | I  | I  | I          | I                               | I  |    | I                       |
| 20 |   | (pani               |                  | R <sup>5</sup>   | I   | I   | I                   | I   | I                   | COC <sub>3</sub> H <sub>7</sub> -n | ·  | I  | I                | r   | I                | GH <sub>3</sub> | I                               | I  | I  | r          | I                               | I  |    | I                       |
| 25 |   | Table 7 (continued) |                  |                  |   |   |                     |   |                     |                                    |  |  |                  |   |                  |                 |                                 |  |  |            |                                 |  |    |                         |
| 30 |   | Table               |                  | π4               | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO2C2H5             | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | tert-C4H9           | CO <sub>2</sub> CH <sub>3</sub>    | CO <sub>2</sub> C <sub>3</sub> H <sub>7</sub> -n | CO <sub>2</sub> C <sub>3</sub> H <sub>7</sub> -iso | COCH2CN          | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | c <sub>H</sub> 3 | СН3             | . C <sub>e</sub> H <sub>5</sub> | CO <sub>2</sub> C <sub>3</sub> H <sub>7</sub> -n | CO <sub>2</sub> C <sub>4</sub> H <sub>9</sub> -sec | сосносн    | CO <sub>2</sub> CH <sub>3</sub> | CO <sub>2</sub> C <sub>4</sub> H <sub>9</sub> -iso | 0= | O-2-                    |
| 35 |   |                     |                  | -                | 0   | 7   | 0                   | 0   | 0                   | 0                                  | 0  | 0  | 0                | 7   | 7                | 7               |                                 | 0  | 0  | 0          | 0                               | 0  |    | 0                       |
| 40 | • |                     | ,                | R                | $(CH_2)_3F$                                   | $CH_2CF_3$                                    | CH=CH <sub>2</sub>  | CH <sub>2</sub> CI                            | CH <sub>3</sub>     | CH <sub>3</sub>                    | $C_2H_5$   | $C_2H_5$   | c <sub>H</sub> 3 | CH <sup>3</sup>                               | CH <sub>3</sub>  | снз             | снз                             | $C_2H_5$   | $C_2H_5$   | $C_2H_5$   | CH=CH <sub>2</sub>              | $C_2H_5$   |    | C2H5                    |
| 45 |   |                     | (                | Α <sub>2</sub>   | I   | I   | I                   | I   | I                   | I                                  | I  | I  | I                | r   | I                | I               | r                               | I  | r  | I          | I                               | I  |    | I                       |
|    |   |                     | •                | 2                | ਹ   | ັວ  | ប                   | ਹ   | ប                   | $\bar{c}$                          | ਹ  | ರ  | ರ                | ğ   | ប                | ซ               | ਹ                               | Ŗ  | ប  | ប          | ប                               | ប  |    | ਹ                       |
| 50 |   |                     | Compound         | No               | 134   | 135   | 136                 | 137   | 138                 | 139                                | 140  | 141  | 142              | 143   | 144              | 145             | 146                             | 147  | 148  | 149        | 150                             | 151  |    | 152                     |

EP 0 742 202 A2

| 5  |   |                     | melting point or | refractive index | 63 - 66.5 °C    | $n_D^{20} = 1.5843$ | $n_{\rm D}^{20} = 1.5756$                     | $n_{\rm D}^{20} = 1.5681$                        | $n_D^{20} = 1.6051$                           | $n_D^{20} = 1.5931$                           | $n_D^{20} = 1.5694$                           | $n_D^{20} = 1.5956$                           | $n_D^{20} = 1.5850$                           | 109 - 114,5 °C | $n_D^{20} = 1.5901$                                | $n_D^{20} = 1.6231$                           | $n_D^{20} = 1.5811$ | 70 - 72 °C                                    | $n_D^{20} = 1.6141$ | 74 - 75 °C  |
|----|---|---------------------|------------------|------------------|-----------------|---------------------|---|--|---|---|---|---|---|----------------|--|---|---------------------|---|---------------------|---|
| 10 |   |                     | ,                | ,X               | I               | I                   | I   | I  | I   | I   | I   | I   | r   | I              | I  | I   | I                   | I   | I                   | I   |
| 15 |   |                     | •                | å.               | I               | I                   | I   | I  | I   | I   | I   | I   | I   | I              | I  | I   | Ι                   | x   | r                   | I   |
| 20 | 4 | nued)               | ų                | <sub>2</sub>     | CH <sub>3</sub> | r                   | COC <sub>2</sub> H <sub>s</sub>               | COC <sub>3</sub> H <sub>7</sub> -n               | I   | $C_2H_5$                                      | C <sub>3</sub> H <sub>5</sub> -iso            | C <sub>3</sub> H <sub>5</sub> -iso            | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | I              | I  | I   | I                   | I   | I                   | I   |
| 25 | 1 | rabie / (continued) |                  |                  |                 | _                   |   |  |   |   |   |   |   | _              |  |   |                     |   |                     |   |
| 30 | ŀ | Labie               | 4                | Α.               | ς,<br>Σ         |                     | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> C <sub>3</sub> H <sub>7</sub> -n | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | COCH2OCH3                                     | )= °           | CO <sub>2</sub> C <sub>4</sub> H <sub>9</sub> -sec | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO2CH2Si(CH3)3      | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | со2сн3              | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub>     |
| 35 |   |                     |                  | 4                | 7               | 0                   | 0   | 0  | 0   | 0   | 0   | 0   | 0   | 0              | 0  | 0   | 0                   | 0   | 0                   | 0   |
| 40 | • |                     | e d              | ž                | ည် <u>ီ</u>     | $C_2H_5$            | cH <sub>3</sub>                               | $C_2H_5$   | CH <sub>2</sub> F                             | cH <sub>3</sub>                               | C <sub>2</sub> H <sub>5</sub>                 | cH <sub>3</sub>                               | с <del>г</del>                                | CH,            | cH <sub>3</sub>                                    | $C_2H_5$                                      | $C_2H_5$            | CH2OC2H5                                      | сн2осн3             | CH <sub>2</sub> Si(CH <sub>3</sub> ) <sub>3</sub> |
| 45 |   |                     | ć                | ¥                | I               | I                   | I   | I  | I   | I   | I   | I   | I   | I              | r  | I   | r                   | I   | I                   | I   |
|    |   |                     | ī                | ¥                | ਹ               | ច                   | ਹ   | ប  | ច   | ਹ   | ਹ   | ă   | ิ   | ਠ              | ರ  | ā   | $\bar{c}$           | ច   | ō                   | ប   |
| 50 |   |                     | Compound         | No.              | 153             | 154                 | 155   | 156  | 157   | 158   | 159   | 160   | 161   | 162            | 163  | 164   | 165                 | 166   | 167                 | 168   |

| 5  |                     | melting point or | refractive index | $n_{\rm D}^{20} = 1.6336$ | $n_D^{20} = 1.5702$ | $n_D^{20} = 1.6133$ | $n_D^{20} = 1.6018$                               | 156.5 - 169 °C                  | 101.5 - 107 °C                | $n_{\rm D}^{20} = 1.5681$                        | 163 - 168.5 °C                | 131 - 135 °C                                  | $n_0^{20} = 1.6021$                  | 117 - 120.5 °C | $n_D^{20} = 1.5828$                           | $n_D^{20} = 1.5770$                           | $n_D^{20} = 1.5822$                           | $n_D^{20} = 1.5870$                              | n <sub>D</sub> = 1.5834                       |
|----|---------------------|------------------|------------------|---------------------------|---------------------|---------------------|---|---------------------------------|-------------------------------|--|-------------------------------|---|--------------------------------------|----------------|---|---|---|--|---|
| 10 |                     |                  | Α,               | I                         | r                   | r                   | I   | I                               | I                             | I  | I                             | I   | I                                    | I              | I   | I   | I   | I  | I   |
|    |                     |                  | Re               | I                         | I                   | r                   | I   | I                               | I                             | I  | I                             | I   | I                                    | I              | I   | I   | I   | I  | I   |
| 15 |                     |                  |                  |                           | 3                   | $\sim$              |   |                                 |                               |  |                               |   |                                      |                |   |   |   |  |   |
| 20 | (penu               |                  | R <sup>5</sup>   | r                         | CO2CH2SI(CH3        | )<br> -C-0-0-       | -CO <sub>2</sub> C <sub>3</sub> H <sub>7</sub> -n | CO <sub>2</sub> CH <sub>3</sub> | CO2CH2CF3                     | CO <sub>2</sub> C <sub>3</sub> H <sub>7</sub> -n | со2сн3                        | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO(CH <sub>2</sub> ) <sub>5</sub> Br | )=Q            | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> C <sub>3</sub> H <sub>7</sub> -n | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
| 25 | Table 7 (continued) |                  |                  | -£                        |                     |                     |   |                                 |                               |  |                               |   |                                      |                |   |   |   |  |   |
| 30 | Table               |                  | R4               | сосносносн                | I                   | I                   | I   | I                               | I                             | I  | I                             | I   | II.                                  | I              | n-C₄H <sub>9</sub>                            | COC₄H₅-n                                      | $C_2H_5$                                      | C <sub>2</sub> H <sub>5</sub>                    | C <sub>2</sub> H <sub>s</sub>                 |
| 35 |                     |                  | -                | 0                         | 0                   | 0                   | 0   | -                               | -                             |  | <b>-</b> -                    | <del></del>                                   | 0                                    | 0              | 0   | 0   | 0   | 0  | -   |
| 40 |                     |                  | R <sup>3</sup>   | ç<br>F                    | c <sub>H</sub>      | CH3                 | n-C <sub>3</sub> H <sub>7</sub>                   | $C_2H_5$                        | C <sub>2</sub> H <sub>5</sub> | n-C <sub>3</sub> H <sub>7</sub>                  | C <sub>2</sub> H <sub>5</sub> | C <sub>2</sub> H <sub>5</sub>                 | CH <sub>3</sub>                      | CH3            | CH <sub>3</sub>                               | снз   | $C_2H_5$                                      | C <sub>2</sub> H <sub>5</sub>                    | CH <sub>3</sub>                               |
| 45 |                     |                  | R <sup>2</sup>   | I                         | I                   | I                   | I   | I                               | r                             | I  | I                             | I   | I                                    | r              | I   | I   | I   | I  | I   |
|    |                     |                  | 2                | ਠ                         | ប                   | $\overline{o}$      | ਹ   | ō                               | ਠ                             | õ  | ä                             | Б   | ប                                    | ਹ              | ਹ   | $\overline{o}$                                | ਹ   | ä  | ច   |
| 50 |                     | Compound         | No               | 169                       | 170                 | 171                 | 172   | 173                             | 174                           | 175  | 176                           | 177   | 178                                  | 179            | 180   | 181   | 182   | 183  | 184   |

| 5  |                     | melting point or | refractive index | 118 - 123 °C                                    | $n_{\rm D}^{20} = 1.5962$                     | $n_D^{20} = 1.5944$                           | $n_D^{20} = 1.5837$                           | 30 - 38 °C                                    | $n_D^{20} = 1.6021$                           | $n_D^{20} = 1.5922$                           | $n_D^{20} = 1.5930$                           | $n_D^{20} = 1.5622$                           | $n_D^{20} = 1.5852$                           | $n_D^{20} = 1.5854$                           | $n_D^{20} = 1.6182$ | 58 - 62 °C | $n_0^{20} = 1.6020$                           | $n_D^{20} = 1.5950$                           | $n_D^{20} = 1.5880$                           | $n_D^{20} = 1.5852$                           | $n_D^{20} = 1.5858$                           | $n_D^{20} = 1.5728$                           |
|----|---------------------|------------------|------------------|---|---|---|---|---|---|---|---|---|---|---|---------------------|------------|---|---|---|---|---|---|
| 10 | -                   |                  | Α,               | I   | I   | I   | I   | I   | I   | r   | I   | I   | I   | I   | I                   | I          | I   | I   | I   | I   | I   | I   |
| 15 |                     |                  | R                | I   | I   | I   | I   | r   | I   | I   | I   | I   | r   | r   | I                   | I          | I   | I   | I   | I   | I   | I   |
| 20 | (pən                | -                | R <sup>5</sup>   | COCO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CH2CH=CH2                                     | сн₂с≅сн                                       | CH2CH2F                                       | $C_2H_S$                                      | CH3   | C <sub>2</sub> H <sub>5</sub>                 | СН3   | CH <sub>3</sub>                               | C <sub>2</sub> H <sub>5</sub>                 | C <sub>2</sub> H <sub>5</sub>                 | сН³                 | снз        | C <sub>2</sub> H <sub>5</sub>                 | C <sub>2</sub> H <sub>s</sub>                 | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | со2сн3  | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
| 25 | Table 7 (continued) |                  |                  |   |   |   |   |   |   |   |   |   |   |   |                     |            |   |   |   |   |   |   |
| зо | Table               |                  | R <sup>4</sup>   | I   | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | со2сн3              | со2сн3     | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | C <sub>2</sub> H <sub>5</sub>                 | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | со2сн3  | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> |
| 35 |                     |                  | u                | 0   | 0   | 0   | 0   | 0   | 0   | 0   | <del>-</del>                                  | 2   | <del>-</del>                                  | 7   | -                   | 7          | 0   | <del>-</del>                                  | 7   | 0   | -   | 0   |
| 40 | **                  |                  | R <sup>3</sup>   | CH <sub>3</sub>                                 | cH <sub>3</sub>                               | СН3   | cH <sub>3</sub>                               | cH <sub>3</sub>                               | C <sub>2</sub> H <sub>5</sub>                 | C <sub>2</sub> H <sub>5</sub>                 | $C_2H_5$                                      | C <sub>2</sub> H <sub>5</sub>                 | C <sub>2</sub> H <sub>5</sub>                 | $C_2H_5$                                      | $C_2H_5$            | $C_2H_5$   | CH <sub>3</sub>                               | CH3   |
| 45 |                     |                  | R <sup>2</sup>   | I   | I   | I   | I   | I   | r   | I   | I   | I   | I   | I   | I                   | I          | r   | I   | I   | I   | r   | r   |
|    |                     |                  | <u></u>          | ប   | ਹ   | ប   | ប   | ច   | ਹ   | ਹ   | ច   | ਠ   | ច   | $\overline{\mathbf{o}}$                       | ਹ                   | ਹ          | ğ   | ğ   | <u>8</u>                                      | ਹ   | ਠ   | ប   |
| 50 |                     | Compound         | No.              | 185   | 186   | 187   | 188   | 189   | 190   | 191   | 192   | 193   | 194   | 195   | 196                 | 197        | 198   | 199   | 200   | 201   | 202   | 203   |

| 5  |   |                     | melting point or | refractive index | $n_{\rm D}^{20} = 1.5783$                          | $n_D^{20} = 1.5749$                             | amorphous                                       | $n_{\rm D}^{20} = 1.6528$            | $n_D^{20} = 1.5944$                              | $n_0^{20} = 1.5763$                                | $n_D^{20} = 1.5977$                           | $n_D^{20} = 1.5990$                           | $n_0^{20} = 1.5890$                           | $n_D^{20} = 1.5980$                           | $n_{\rm D}^{20} = 1.6140^{'}$ | $n_D^{20} = 1.5808$                | $n_0^{20} = 1.6308$             |
|----|---|---------------------|------------------|------------------|--|---|---|--------------------------------------|--|--|---|---|---|---|-------------------------------|------------------------------------|---------------------------------|
| 10 |   |                     |                  | R7               | I  | I   | I   | I                                    | I  | I  | I   | I   | I   | I   | r                             | I                                  | I                               |
| 15 |   |                     |                  | R                | I  | I   | I   | I                                    | I  | I  | I   | I   | I   | I   | I                             | I                                  | I                               |
| 20 |   | inued)              |                  | R5               | C <sub>2</sub> H <sub>5</sub>                      | (CH <sub>2</sub> ) <sub>5</sub> CH <sub>3</sub> | C <sub>2</sub> H <sub>5</sub>                   | I                                    | I  | I  | CH <sub>2</sub> CN                            | COC <sub>6</sub> H <sub>5</sub>               | COC,Hs  | COC <sub>6</sub> H <sub>5</sub>               | $C_2H_5$                      | C <sub>2</sub> H <sub>5</sub>      | сосн                            |
| 25 |   | Table 7 (continued) |                  |                  |  |   |   |                                      |  |  |   |   |   |   |                               |                                    |                                 |
| 30 |   | Table               |                  | ₽₩               | CO <sub>2</sub> C <sub>4</sub> H <sub>9</sub> -iso | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub>   | CO <sub>2</sub> CH <sub>2</sub> CF <sub>3</sub> | COC <sub>3</sub> H <sub>7</sub> -iso | CO <sub>2</sub> C <sub>4</sub> H <sub>9</sub> -n | CO <sub>2</sub> C <sub>4</sub> H <sub>9</sub> -Iso | CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub> | COCH <sub>3</sub>             | COC <sub>3</sub> H <sub>7</sub> -n | COC <sub>6</sub> H <sub>5</sub> |
| 35 |   |                     |                  | _                | 0  | 0   | 0   | 0                                    | -  | -  | 0   |   | ₩.  | 2   | 0                             | 7                                  | 0                               |
| 40 | ~ |                     |                  | R³               | CH <sub>3</sub>                                    | cH <sub>3</sub>                                 | CH <sub>3</sub>                                 | CH3                                  | CH <sub>3</sub>                                  | C <sub>2</sub> H <sub>5</sub>                      | cH <sub>3</sub>                               | $C_2H_5$                                      | $C_2H_5$                                      | $C_2H_5$                                      | CH <sub>3</sub>               | $C_2H_5$                           | CH <sub>3</sub>                 |
| 45 |   |                     |                  | R <sup>2</sup>   | I  | I   | I   | I                                    | I  | r  | I   | I   | I   | r   | I                             | I                                  | I                               |
|    |   |                     |                  |                  | ರ  |   |   |                                      |  |  |   |   |   |   |                               |                                    | ច                               |
| 50 |   |                     | Compound         | No.              | 204  | 205   | 206   | 207                                  | 208  | 209  | 210   | 211   | 212   | 213   | 214                           | 215                                | 216                             |

### Synthesis of Intermediates

### Synthesis Example 8

5

10

To an acetonitrile solution (200 ml) of 4-bromomethyl-4'-fluorobenzophenone (20 g), an aqueous 15% sodium methylmercaptan solution (60 ml) was added and the mixture was heated for 6 hours with refluxing. After the reaction mixture
was restored to room temperature, water (500 ml) and toluene (300 ml) were added. The organic layer was separated,
which was then successively washed with an aqueous 2N sodium hydroxide solution and water, and dried over anhydrous magnesium sulfate. After distilling off the solvent, the crude product was purified by silica gel column chromatography (developing solvent n-hexane:ethyl acetate = 9:1) to obtain 4-fluoro-4'-methylmercaptomethylbenzophenone (17

n<sub>D</sub><sup>20</sup> 1.6375

### Synthesis Example 9

25

35

30

To an ether solution (30 ml) of 4-bromoflurorobenzene (1.75 g), 1.6 M n-butyllithium hexane solution (6.3 ml) was added at -78 °C, and the mixture was stirred for an hour at the same temperature. An ether solution (10 ml) of 4-methylmercaptomethylbenzonitrile (1.63 g) was dropwise added thereto at -78 °C, and the mixture was stirred for 16 hours while restoring the mixture gradually to room temperature. To the reaction mixture, an aqueous 6 N hydrochloric acid was added and stirred for an hour at room temperature, and ether (20 ml) was added. Then the organic layer was separated, and washed with water, followed by drying over anhydrous magnesium sulfate. After distilling off the solvent, the obtained crude product was purified by silica gel column chromatography (developing solvent, n-hexane : ethyl acetate = 9 : 1) to obtain 4-fluoro-4'-methylmercaptomethylbenzophenone (1.12 g).  $n_0^{20}$  1.6375

### Synthesis Example 10

50

45

55

S-(4-(4-chlorobenzoyl)benzyl)thiouronium bromide (3.3 g) and potassium carbonate (1.5 g) were dissolved in dimethyl-formamide (20 ml). A methanol solution (10 ml) of potassium hydroxide (1.0 g) was added and stirred at room temper-

ature for 30 minutes. To the reaction mixture, water (100 ml) and toluene (100 ml) were added. The organic layer was separated, and washed with water and an aqueous saturated sodium chloride solution, followed by drying over anhydrous magnesium sulfate. After distilling off the solvent, the crude product was purified by silica gel column chromatography (developing solvent: ethyl acetaten:hexane = 1:9) to obtain 4-chloro-4'-ethylmercaptomethylbenzophenone (1.3 q).

melting point: 34 - 35 °C

4-chloro-4'-difluoromethylmercaptomethylbenzophenone (0.8 g) was obtained in the same manner as in Synthesis Example 10 by using bromodifluoromethane (3.9 g) instead of ethyl iodide.

melting point: 60 - 62 °C

4-chloro-4'-trifluoromethylmercaptomethylbenzophenone (0.4 g) was obtained in the same manner as in Synthesis Example 10 by using trifluoromethyl iodide (5.9 g) instead of ethyl iodide. melting point: 78 - 79°C

Synthesis Example 11 (Synthesis of starting material for Synthesis Example 10)

15

20

5

An acetone solution (500 ml) of 4-bromomethyl-4'-chlorobenzophenone (31 g) and thiourea (10 g) was heated for 30 minutes with refluxing. The precipitated crystals were then collected by filtration and washed with acetone to obtain S-(4-(4-chlorobenzoyl)benzyl)thiouronium bromide (33 g). melting point: 76 - 78°C

#### Synthesis Example 12

30

40

To a tetrahydrofuran solution (30 ml) of lithium diisopropylamide which was prepared from a 1.6 M n-butyllithium hexane solution (12.5 ml) and diisopropylamine (2.1 g), a tetrahydrofuran solution (10 ml) of 4-chloro-4'-methylmercaptomethylbenzophenone (2.8 g) was added at -78°C, and the mixture was stirred for 30 minutes at the same temperature. Ethyl iodide (3.0 g) was subsequently added thereto at -78°C, and the mixture was stirred for 6 hours while restoring the mixture gradually to room temperature. After completing the reaction, the reaction mixture was washed with aqueous 5% ammonium chloride solution and aqueous saturated sodium chloride solution, and dried over anhydrous magnesium sulfate. After distilling off the solvent, the obtained crude product was purified by silica gel column chromatography (developing solvent: n-hexane:ethyl acetate = 4:1) to obtain 4-chloro-4'-(1-methylmercaptopropyl)benzophenone (0.3 g) as oily substance.

<sup>1</sup>H-NMR (90 MHz, CDCl<sub>3</sub>) (0.93 3H t) (1.88 3H s) (1.96 2H m) (3.63 1H t) (7.27-7.80 8H m)

#### Synthesis Example 13

5

10

To a pyridine solution (30 ml) of 4-(4-chlorobenzolyl)benzylthiocyanate (1.5 g) and benzylthiocyanate (1.5 g), zinc powder (0.4 g) was added and stirred at room temperature for 24 hours under trifluoromethyl iodide atmosphere. Then toluene (50 ml) was added and zink powder was filtered off. The filtrate was washed with 2N HCl aq. (30 ml tree times) and dried over anhydrous magnesium sulfate. After the solvent was evaporated the residue was purified by means of column chromatography (n-hexane: ethylacetate = 6:1). Then 4-chloro-4'-trifluoromethylmercaptobenzophenone (0.5 g) was obtained.

melting point: 78 -79°C

### Synthesis Example 14

25

20

30

A mixture of 4-chloro-4'-(2-chloroethylmercaptomethyl)benzophenone (4.9 g) and 1,8-diaza-bicyclo[5.4.0]undec-7-ene (4.3 g) in 100ml of toluene was stirred for 3 hours at 80 °C. After that, the mixture was washed with aqueous 2N hydrochloric acid solution and water, followed by drying over anhydrous sodium-sulfate. The solvent was distilled off under reduced pressure to obtain 4-chloro-4'-vinylmercaptomethylbenzophenone (4.3 g).  $n_D^{20}$  1.6363

## Synthesis Example 15

40

45

50

To an acetic acid solution (30 ml) of 4-chloro-4'-methylmercaptomethylbenzophenone (8.3 g), aqueous 30% hydrogen peroxide solution (3.5 ml) was added, and the mixture was stirred for 2 hours while keeping at 10°C. To the reaction solution, water (200 ml) and toluene (200 ml) were added, and then the organic layer was separated, and washed successively with water, an aqueous sodium bicarbonate solution and an aqueous saturated sodium chloride solution, followed by drying over anhydrous magnesium sulfate. After distilling off the solvent, the crude product was purified by silicagel column chromatography (developing solvent: acetone:n-hexane = 50:50) to obtain 4-chloro-4'-methylsulfinyl-methylbenzophenone (5.3 g).

melting point: 125 -128°C

#### Synthesis Example 16

5

10

4-Chloro-4'-methylsulfinylmethylbenzophenone (2.9 g) and m-chloroperbenzoic acid (2.5 g) were dissolved in dichloromethane, and the mixture was stirred for 12 hours at 0°C. After the precipitated crystals were filtered off, the filtrate
was successively washed with aquous sodium bicarbonate solution, aqueous 5% sodium thiosulfate solution and water,
and dried over anhydrous magnesium sulfate. After distilling off the solvent, the crude product was purified by silica gel
column chromatography (developing solvent: ethyl acetate:n-hexane = 1.5) to obtain 4-chloro-4'-methylsulfonylmethylbenzophenone (1.8 g).

20 melting point: 173 - 174°C

### Synthesis Example 17

25

30

- 35 To an acetic acid solution (70 ml) of 4-chloro-4'-methylmercaptomethylbenzophenone (8.3 g), aqueous 30% hydrogen peroxide solution (7 ml) was added at room temperature, and the mixture was stirred for 6 hours at 70°C. The reaction mixture was poured into ice-water, and the precipitated crystals was collected by filtration, and washed with an aqueous sodium bicarbonate solution and water. The crystals was then air-dried to obtain 4-chloro-4'-methylsulfonylmethylbenzophenone (4.3 g).
- melting point: 173 174°C

Reference Example 1 (Synthesis of starting materials for Synthesis Example 8)

45

50

A carbon tetrachloride solution (200 ml) of 4-fluoro-4'-methylbenzophenone (16 g), N-bromosuccinimide (14.2 g) and 2,2'-azodi-isobutyronitrile (0.1 g) was heated for 16 hours with refluxing. After the mixture was cooled to a room temperature, the precipitates were collected by filtration, and the solvent was distilled off to obtain 4-bromomethyl-4'-fluorobenzophenone (20 g).

melting point: 73 - 75°C

Reference Example 2 (Synthesis of starting material for Reference Example 1)

F CH,

10

5

Into a toluene suspension (200 ml) of aluminum chloride (26 g), a toluene solution (50 ml) of p-fluorobenzoyl chloride (16 g) was dropwise added at a room temperature. Subsequently, the mixture was stirred for 20 hours at a room temperature, and then carefully poured into ice-water. Toluene (200 ml) was added thereto, and then the organic layer was separated, and washed successively with aqueous 2N hydrochloric acid solution, water and aqueous saturated sodium chloride solution, followed by drying over anhydrous sodium sulfate. The solvent was distilled off under reduced pressure to obtain 4-fluoro-4'-methylbenzophenone (16 g). melting point: 97 - 98°C

20 Reference Example 3 (Synthesis of starting material for Synthesis Example 9)

NC CH<sub>2</sub>-S-CH

25

To an acetonitrile solution (500 ml) of 4-cyanobenzyl bromide (50 g), 15% methyl mercaptan sodium salt (120 ml) was added at a room temperature and heated for 6 hours with refluxing. After cooling to a room temperature, water (1 l) and toluene (1 l) was added thereto. The organic layer was separated and washed successively with an aqueous 2N sodium hydroxide solution sulfate. After distilling off the solvent, 4-methylmercaptomethylbenzonitrile (38 g) was obtained.

The following Table 8 shows the compounds synthesized in the above Synthesis Examples 8 to 17 together with compounds synthesized in the same manner as those in the Synthesis Examples 8 to 17.

40

45

50

Table 8

P C R

5

| 10 |       |       |                   |  | · ·                                  |
|----|-------|-------|-------------------|--|--------------------------------------|
| ·  | $R^1$ | $R^6$ | R <sup>7</sup>    | A  | Melting Point or<br>Refrective Index |
| 15 | Br    | Н     | Н                 | CH <sub>2</sub> SC(=NH)NH <sub>2</sub> ·HBr  | 225 - 231 °C                         |
|    | Cl    | Н     | Н                 | CH(CH <sub>3</sub> )SC(=NH)NH <sub>2</sub> ·HBr  | 158 - 159 °C                         |
|    | Cl    | H     | H                 | CH <sub>2</sub> SC(=NH)NH <sub>2</sub> ·HBr  | 76 - 78 °C                           |
| 20 | Cl    | Н     | 2-C1              | CH <sub>2</sub> SC(=NH)NH <sub>2</sub> ·HBr CH(CH <sub>3</sub> )SC(=NH)NH <sub>2</sub> ·HBr CH <sub>2</sub> CC(=NH)NH <sub>2</sub> ·HBr CH <sub>2</sub> SC(=NH)NH <sub>2</sub> ·HBr CH <sub>2</sub> SC(S)OC <sub>2</sub> H <sub>5</sub> CH <sub>2</sub> S(CS)OC <sub>2</sub> H <sub>5</sub> CH <sub>2</sub> S(CO)CH <sub>3</sub> CH <sub>2</sub> SC <sub>2</sub> H <sub>5</sub> CH <sub>2</sub> SC <sub>2</sub> H <sub>5</sub> CH <sub>2</sub> SC <sub>2</sub> H <sub>5</sub> CH <sub>2</sub> SC <sub>3</sub> H <sub>7</sub> -iso CH <sub>2</sub> SC <sub>4</sub> S CH <sub>2</sub> SC <sub>4</sub> S CH <sub>2</sub> SC <sub>4</sub> S CH <sub>2</sub> SC <sub>5</sub> S CH <sub>2</sub> SC <sub>5</sub> S CH <sub>2</sub> SC <sub>6</sub> S CH <sub>2</sub> SC <sub>7</sub> S CH <sub></sub> | 110 - 114 °C                         |
|    | Cl    | H     | 3-Cl              | CH <sub>2</sub> SC(=NH)NH <sub>2</sub> ·HBr  | 198 - 201 °C                         |
|    | I     | Н     | H                 | CH <sub>2</sub> SC(=NH)NH <sub>2</sub> ·HBr  | 196 - 210 °C                         |
| 25 | Cl    | Н     | H                 | CH <sub>2</sub> SCN  | 149 - 150 °C                         |
|    | Cl    | Н     | H                 | CH <sub>2</sub> S(CS)OC <sub>2</sub> H <sub>5</sub>  | 62 - 68 °C                           |
|    | Cl    | Н     | H                 | CH <sub>2</sub> S(CO)CH <sub>3</sub>   | 98 - 99 °C                           |
|    | Br    | H     | H                 | CH <sub>2</sub> SC <sub>2</sub> H <sub>5</sub>   | 46 - 48 °C                           |
| 30 | Cl    | H     | H                 | CH(CH <sub>3</sub> )SCH <sub>3</sub>   | n <sup>20</sup> 1.6198               |
|    | Cl    | Н     | Н                 | CH <sub>2</sub> SC <sub>2</sub> H <sub>5</sub>   | 34 - 35 °C                           |
| 35 | Cl    | H     | Н                 | CH <sub>2</sub> SC <sub>3</sub> H <sub>7</sub> -iso  | $n_D^{20}$ 1.6320                    |
|    | Cl    | Н     | Н                 | CH <sub>2</sub> SC <sub>3</sub> H <sub>7</sub> -n  | n <sub>D</sub> <sup>20</sup> 1.6211  |
|    | Cl    | Н     | Н                 | CH <sub>2</sub> SCF <sub>3</sub>   | 78 - 79 °C                           |
| 40 | CI    | Н     | H                 | CH <sub>2</sub> SCH <sub>2</sub> C≡CH  | 80 - 81 °C                           |
|    | Cl    | H     | H                 | CH <sub>2</sub> SCH <sub>2</sub> CF <sub>3</sub>   | 77 - 78 °C                           |
|    | Cl    | Н     | Н                 | CH2SCH=CH2   | n <sup>20</sup> 1.6363               |
| 45 | CI    | Н     | Н                 | CH <sub>2</sub> SCH <sub>2</sub> CH=CH <sub>2</sub>  | n <sub>D</sub> <sup>20</sup> 1.6368  |
|    | Cl    | Н     | Н                 | CH <sub>2</sub> SCH <sub>2</sub> CH <sub>2</sub> Cl  | 65 - 67 °C                           |
|    | Cl    | H     | Н                 | CH <sub>2</sub> SCH <sub>2</sub> CH <sub>2</sub> F   | 44 - 45 °C                           |
| 50 | Cl    | Н     | 3-Br              | CH <sub>2</sub> SCH <sub>3</sub>   | $n_D^{20}$ 1.6502                    |
|    | Cl    | Н     | 3-CH <sub>3</sub> | CH <sub>2</sub> SCH <sub>3</sub>   | n <sup>20</sup> 1.6345               |
|    |       |       |                   |  |                                      |

## Table 8 (continued)

| 5  | R <sup>1</sup> | R <sup>6</sup> | R <sup>7</sup>    | Α   | Melting Point or<br>Refrective Index |
|----|----------------|----------------|-------------------|---|--------------------------------------|
| 10 | CI             | Н              | 2-CH <sub>3</sub> | CH <sub>2</sub> SCH <sub>3</sub>                                    | $n_D^{20} = 1.6324$                  |
|    | Cl             | Н              | H                 | CH <sub>2</sub> SCHF  | n <sub>0</sub> <sup>20</sup> 1.6237  |
|    | Cl             | Н              | Н                 | CH <sub>2</sub> SCHF <sub>2</sub>                                   | 60 - 62 °C                           |
| 15 | C1             | H              | H                 | $CH_2(SO_2)CH_3$  | 173 - 174 °C                         |
|    | Cl             | H              | H                 | CH <sub>2</sub> (SO)CH <sub>3</sub>                                 | 125 - 128 °C                         |
|    | Cl -           | 2-C1           | Н                 | CH <sub>2</sub> SCH <sub>3</sub>                                    | n <sup>20</sup> 1.6369               |
| 20 | Cl             | 3-C1           | Н                 | CH <sub>2</sub> SCH <sub>3</sub>                                    | 66 - 67 °C                           |
|    | F              | Н              | Н                 | CH <sub>2</sub> SCH <sub>3</sub>                                    | $n_0^{20}$ 1.6375                    |
| 25 | F              | 3-F            | H                 | CH <sub>2</sub> SCH <sub>3</sub>                                    | n <sub>D</sub> <sup>20</sup> 1.6306  |
|    | I              | Н              | Н                 | CH <sub>2</sub> SCH <sub>3</sub>                                    | 89 - 91 °C                           |
|    | Cl             | Н              | Н                 | CH <sub>2</sub> SCH <sub>2</sub> CN                                 | 87.5 - 88 °C                         |
| 30 | Cl             | Н              | H                 | CH <sub>2</sub> SCH <sub>2</sub> CHF <sub>2</sub>                   | 59 - 60.5 °C                         |
|    | Cl             | Н              | H                 | CH <sub>2</sub> SCH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> CI | $n_D^{20}$ 1.6113                    |
|    | Br             | Н              | H                 | CH <sub>2</sub> SCH <sub>2</sub> CF <sub>3</sub>                    | 79.5 - 81.5 °C                       |
| 35 | Br             | Н              | H                 | CH <sub>2</sub> SCH <sub>2</sub> CHF <sub>2</sub>                   | 62 - 64 °C                           |
|    | Cl             | H              | H                 | CH <sub>2</sub> SCH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> F  | 39 - 40.5 °C                         |
|    | Cl             | H              | H                 | $CH_2SCH_2Si(CH_3)_3$   | 95 - 100 °C                          |

### **Biological Test Examples**

## Preparation of test solutions

Solvent: 3 parts by weight of xylol

Emulsifier: 1 part by weight of polyoxyethylene alkyl phenyl ether

To produce a suitable preparation of active compound, 1 part by weight of active compound was mixed with the stated amount of solvent containing the stated amount of emulsifier, and the mixture was diluted with water to the prescribed concentration to prepare test solutions.

55

40

Test Example 1 (Test against Spodoptera litura larvae)

#### Testing procedure

Leaves of cabbage (Brassica oleracea) were dipped into the solution of the active compound at the prescribed concentration. After air-drying the solution, the treated leaves were placed in a petridish, and ten third-instar larvae of common cutworm (*Spodoptera litura*) were released. The dish was then placed at an incubation chamber of 25°C. After 7 days, the number of dead larvae was examined to calculate mortality in %. The test was conducted with 2 replications, and the mortality in % is shown in their average.

#### Results

10

20

Compound Nos. 8, 12, 16, 34, 37, 43, 48, 50, 54, 57, 60, 63, 74, 83, 92, 106, 171, 121, 125, 132, 139, 140, 141, 142, 147, 148, 149, 151, 152, 155, 157, 158, 159, 160, 161, 162, 163, 164, 165, 168, 170, 171, 172, 173, 174, 175 and 176 exhibited 100 % of mortality at the concentration of 200 ppm, and compound Nos. 1, 5, 22, 29, 33, 40, 47, 49, 68, 75, 79, 87, 100, 111, 113, 116, 123, 130, 133, 135, 136, 137, 143, 144, 145, 150, 154, 156 and 169 exhibited 100 % of mortality at the concentration of 100 ppm.

Test Example 2 (Test against Aulacophora femoralis )

### Testing procedure

Leaves of cucumber (*Cucumis sativus*) were dipped into the solution of the active compound at the prescribed concentration. After air-drying the solution, the treated leaves were placed in a Petridish, and ten second-instar larvae of cucurbit leaf beetle (*Aulacophora femoralis*) were released. The dish was then placed at an incubation chamber of 25°C. After 7 days, the number of dead larvae was examined to calculate mortality in %. The test was conducted with 2 replications, and the mortality in % is shown in their average.

#### Results

30

Compound Nos. 3, 7, 15, 18, 23, 25, 31, 36, 39, 44, 51, 58, 59, 61, 65, 73, 77, 78, 84, 85, 91, 93, 96, 98, 101, 103, 109, 114, 115, 119, 120, 126, 129, 131, 133, 135, 136, 140, 145, 148, 150, 152, 154, 156, 163, 167, 169, 170 and 172 exhibited 100 % of mortality at the concentration of 200 ppm.

35 Test Example 3 (Test against Plutella xylostella larvae resistant to benzoylureas)

### Testing procedure

Leaves of cabbage (Brassica oleracea) were dipped into the solution of the active compound at the prescribed concentration. After air-drying the solution, the treated leaves were placed in a petridish, and ten second-instar larvae of
diamondback moth (*Plutella xylostella*) resistant to benzoylureas were released. The dish was then placed at an incubation chamber of 25°C. After 7 days, the number of dead larvae was examined to calculate mortality in %. The test
was conducted with 2 replications, and the mortality in % is shown in their average.

### 45 Results

50

Compound Nos. 2, 11, 15, 17, 20, 26, 28, 30, 35, 41, 45, 53, 56, 62, 69, 71, 81, 86, 88, 90, 97, 99, 102, 104, 107, 127, 134, 139, 142, 147, 149, 152, 154, 156, 159, 167 and 168 exhibited 100 % of mortality at the concentration of 200 ppm.

Test Example 4 (Test against Cnaphalocrocis medinalis)

#### Testing procedure

The solution of the active compound at the prescribed concentration were spread on 3.5-leaf stage of rice. After air-drying the solution, the treated leaves were cut and were placed in a Petridish, and ten third-instar larvae of rice leaf-roller (*Cnaphalocrocis medinalis*) were released. The dish was then placed at an incubation chamber of 25°C. After 7 days, the number of dead larvae was examined to calculate mortality in %. The test was conducted with 2 replications, and the mortality in % is shown in their average.

#### Results

5

10

20

25

30

50

55

Compound Nos. 4, 9, 10, 13, 24, 27, 32, 42, 46, 52, 55, 64, 67, 70, 72, 76, 82, 89, 94, 95, 105, 108, 110, 112, 124, 128, 140, 148, 151, 160, 163 and 165 exhibited 100 % of mortality at the concentration of 50 ppm.

Test Example 5 (Test against Diabrotica balteata)

#### Preparation of test formulation

carrier: 7 parts by weight of Kaolin emulsifier: 1 part by weight of detergent

For the seed treatment a certain amount of active ingredient is solved acetone and mixed into a the stated amount of carrier containing the stated amount of emulsifier.

For seed coating 200 mg of the formulation are dispersed with 0.2 ml of water within a plastic pot. 10 g of maize are added to the dispersion and mixed thoroughly on rotary shaker for 2 minutes.

### Testing procedure

After drying of the seed coating five treated/untreated seedcernels were added into 300 ml of standardized wet soil and kept at a temperature of 20 °C. Two replications are prepared for each preparation.

After two days each pot is infested with 20 second-instar-larvae of *Diabrotica balteata*, seven days after infestation the number of emerged plants per pot is counted.

The efficacy is calculated to 100 % Abbot, if all plants emerged and to 0 % Abbot, if no plant emerged.

#### Results

Compound Nos. 8, 39, 70 and 95 exhibited 100 % of mortality at the 0.1 g of the active ingredient per 10 g seed-cernels.

### Claims

## 1. Compounds of the formula:

### wherein

R<sup>1</sup> is halogen,

 $R^2$  is hydrogen or  $C_{1-4}$  alkyl,

R<sup>3</sup> is cyano, optionally substituted C<sub>1-4</sub> alkyl, C<sub>2-4</sub> alkenyl or C<sub>3-4</sub> alkynyl, C<sub>1-4</sub> alkyl-carbonyl or C<sub>1-4</sub> alkoxy-thiocarbonyl,

is hydrogen, phenyl, optionally substituted C<sub>1-8</sub> alkyl, optionally substituted C<sub>1-8</sub> alkyl, optionally substituted C<sub>2-8</sub> alkenyl, -CO-R<sup>8</sup>, -CO-O-R<sup>9</sup> or

$$-\frac{Z}{C} \cdot N \cdot R^{10}$$

5

10

15

20

is hydrogen, formyl, phenyl, optionally substituted  $C_{1-8}$  alkyl, optionally substituted  $C_{2-8}$  alkenyl, optionally substituted  $C_{1-8}$  alkyl-carbonyl, optionally substituted  $C_{1-6}$  alkyl-oxalyl, optionally substituted  $C_{1-8}$  alkoxy-carbonyl, optionally substituted  $C_{1-8}$  alkoxy-oxalyl, optionally substituted  $C_{2-8}$  alkenyl-carbonyl or optionally substituted  $C_{2-8}$  alkenyl-carbonyl or optionally substituted benzoyl,

R<sup>6</sup> is hydrogen or halogen,

 $R^7$  is hydrogen, halogen or  $C_{1-2}$  alkyl,

is 0, 1 or 2, provided that n is 0 when  $R^3$  is cyano,  $C_{1-4}$  alkyl-carbonyl or  $C_{1-4}$  alkoxy-thiocarbonyl,

is a single bond of Anti form or of Syn form,

is optionally substituted  $C_{1-8}$  alkyl, optionally substituted  $C_{2-8}$  alkenyl, optionally substituted phenyl, optionally substituted  $C_{3-8}$  cycloalkyl, optionally substituted  $C_{1-8}$  alkyl-carbonyl or optionally substituted  $C_{1-8}$  alkoxy-carbonyl, or hydrogen,

is optionally substituted  $C_{1-8}$  alkyl, optionally substituted  $C_{3-8}$  cycloalkyl, optionally substituted  $C_{2-8}$  alkenyl or optionally substituted  $C_{3-8}$  alkynyl,

R<sup>10</sup> is hydrogen or C<sub>1-4</sub> alkyl,

 $R^{11}$  is hydrogen, optionally substituted  $C_{1-4}$  alkyl or optionally substituted phenyl and,

Z is oxygen or sulfur.

25

R9

2. Process for the preparation of compounds of formula (I) according to claim 1, characterized in that

(a) in the case where R<sup>5</sup> is hydrogen: compounds of the formula (II)

30

$$\mathbb{R}^{6} \stackrel{\text{II}}{\underset{\text{R}^{2}}{\bigvee}} \mathbb{C} \stackrel{\text{CH-S(O)}_{n-R^{3}}}{\underset{\text{R}^{2}}{\bigvee}}$$
(II)

40

35

wherein R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>6</sup>, R<sup>7</sup> and n are defined as in claim 1, are reacted with compounds of the formula (III)

45

$$R^4$$

$$\begin{cases}
N \\
N \\
NH_2
\end{cases}$$
(III)

50

wherein R4 is defined as in claim 1;

in the presence of an inert solvent, and, if appropriate, in the presence of an acid catalyst, or

(b) in the case where R5 is hydrogen and R4 is

$$-C-N$$

and R<sup>11</sup> is not hydrogen, then R<sup>11</sup> is replaced by R<sup>12</sup>, then R<sup>12</sup> is optionally substituted C<sub>1.4</sub> alkyl or optionally substituted phenyl:

compounds of the formula (IV)

5

10

15

20

25

30

35

40

45

50

55

wherein R1, R2, R3, R6, R7 and n are defined as above, are reacted with compound of the formula (V)

wherein R12 is optionally substituted C1-4 alkyl or optionally substituted phenyl, in the presence of an inert solvent,

(c) in the case where R4 is -CO-R8 or -CO-O-R9, provided that R8 is not hydrogen, then R8 or -O-R9 is replaced by R13, the aforementioned compounds of the formula (IV) are reacted with compounds of the formula (VI)

$$\begin{array}{c}
0\\
\text{Pal}
\end{array}$$
(VI)

wherein hal is chlorine or bromine and R13 is R8 or -O-R9, in the presence of an inert solvent, and if appropriate in the presence of an acid binder,

(d) in the case where R<sup>5</sup> is not hydrogen, then R<sup>5</sup> is replaced by R<sup>14</sup>: compounds of the formula (VII)

wherein  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^6$ ,  $R^7$  and n have the same meaning as mentioned above, are reacted with compounds of the formula (VIII)

5

wherein hal and  $R^{14}$  have the same meaning as mentioned above, in the presence of an inert solvent, and if appropriate in the presence of an acid binder,

or

(e) in the case where n is 1: compounds the formula (IX)

15

10

$$\begin{array}{c}
R^{5} \\
N \\
R^{6}
\end{array}$$

$$\begin{array}{c}
R^{6} \\
R \\
\end{array}$$

$$\begin{array}{c}
R^{7} \\
C \\
R^{7}
\end{array}$$

$$\begin{array}{c}
CH \\
R^{2}
\end{array}$$

20

25

wherein  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$  and  $R^7$  have the same meaning as mentioned above, are oxidized in the presence of an inert solvent,

0

(f): in the case where n is 2: compounds of the formula (X)

30

35

40

wherein R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup> and R<sup>7</sup> have the same meanings as mentioned above and q is 0 or 1, are oxidized in the presence of an inert solvent.

## 3. Compounds of formula (I) according to claim 1, wherein

R<sup>1</sup> is halogen,

R<sup>2</sup> is hydrogen or C<sub>1-3</sub> alkyl,

50

is cyano,  $C_{1-4}$  alkyl which may be substituted by one or more than one substituent selected from the group consisting of halogen, cyano, methoxy, ethoxy and trimethylsilyl or is  $C_{2-3}$  alkenyl, propargyl, methyl-carbonyl, methoxy-thiocarbonyl or ethoxy-thiocarbonyl,

 $R^4$  is hydrogen,  $C_{1.4}$  alkyl,  $C_{2.4}$  alkenyl, phenyl, or is benzyl, -CO- $R^8$ , -CO-O- $R^9$  or

$$\frac{Z}{C} \cdot N \cdot R^{10}$$

is hydrogen, formyl, phenyl,  $C_{1.6}$  alkyl which may be substituted by one or more than one substituent selected from the group consisting of halogen, cyano,  $C_{1.4}$  alkoxy,  $C_{1.4}$  alkylthio, hydroxycarbonyl,  $C_{1.4}$  alkoxy-carbonyl, phenyl, which is substituted by halogen and methoxyphenyl or is  $C_{2.6}$  alkenyl,  $C_{3.6}$  alkyl-carbonyl,  $C_{1.6}$  halogenalkyl-carbonyl,  $C_{1.4}$  alkoxy- $C_{1.6}$  alkyl-carbonyl,  $C_{1.6}$  alkyl-carbonyl which may be substituted by one or more than one substituent selected from the group consisting of  $C_{3.6}$  cycloalkyl and  $C_{1.4}$  alkoxy or is  $C_{1.6}$  alkoxy-oxalyl,  $C_{3.6}$  cycloalkyl-carbonyl which may be substituted by  $C_{1.4}$  alkyl,  $C_{2.6}$  alkenyl-carbonyl which may be substituted by one or more than one substituent selected from the group consisting of halogen, nitro, cyano,  $C_{1.4}$  alkoxy and  $C_{1.4}$  alkylthio,

R<sup>6</sup> is hydrogen or halogen,

5

20

35

45

50

R<sup>7</sup> is hydrogen or halogen or C<sub>1-2</sub> alkyl,

n is 0, 1 or 2, provided that n is 0 when R<sup>3</sup> is cyano, methyl-carbonyl, methoxy-thiocarbonyl or ethoxy-thiocarbonyl,

is a single bond of Anti form or of Syn form,

- is C<sub>1-6</sub> alkyl which may be substituted by one or more than one substituent selected from the group consisting of halogen, cyano, C<sub>1-4</sub> alkoxy, C<sub>1-4</sub> alkoxy-carbonyl and phenoxy or is C<sub>2-6</sub> alkenyl which may be substituted by one or more than one substituent selected from the group consisting of halogen and phenyl, or is phenyl which may be substituted by one or more than one substituent selected from the group consisting of halogen, nitro, cyano, C<sub>1-4</sub> alkyl, C<sub>1-4</sub> alkoxy and C<sub>1-4</sub> alkythio, or is C<sub>3-6</sub> cycloalkyl which may be substituted by C<sub>1-4</sub> alkyl, or is C<sub>1-6</sub> alkyl-carbonyl or C<sub>1-6</sub> alkoxy-carbonyl, or hydrogen,
- 30  $R^9$  is  $C_{1-6}$  alkyl which may be substituted by one or more than one substituent selected from the group consisting of halogen, phenyl 4-nitrophenyl, trimethylsilyl and  $C_{3-6}$  cycloalkyl, or is  $C_{3-6}$  cycloalkyl, or  $C_{2-6}$  alkenyl which may be substituted by phenyl or is  $C_{3-6}$  alkynyl,

R<sup>10</sup> is hydrogen or C<sub>1-4</sub> alkyl,

- R<sup>11</sup> is hydrogen, C<sub>1-4</sub> alkyl which may be substituted by halogen or is phenyl which may be substituted by one or more than one substituent selected from the group consisting of halogen, C<sub>1-4</sub> alkoxy or C<sub>1-4</sub> haloalkoxy and
  - Z is oxygen or sulfur.
- 4. Compounds of formula (I) according to claim 1, wherein

R<sup>1</sup> is fluorine, chlorine, bromine or iodine,

R<sup>2</sup> is hydrogen, methyl, ethyl or n-propyl,

is cyano, methyl, ethyl, propyl, isopropyl, n-butyl, sec-butyl, cyanomethyl, fluoromethyl, chloromethyl, difluoromethyl, trifluoromethyl, 2-fluroroethyl, 2-chloroethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, 3-fluoropropyl, 3-chloropropyl, 2,2,3,3-tetrafluoropropyl, methoxymethyl, ehoxymethyl, trimethylsilylmethyl, vinyl, allyl, propargyl, methyl-carbonyl or ethoxy-thiocarbonyl,

R<sup>4</sup> is hydrogen, methyl, ethyl, propyl, isopropyl, n-butyl, tert-butyl, allyl, phenyl, benzyl, -CO-R<sup>8</sup>, -CO-O-R<sup>9</sup> or

$$-C \cdot N \cdot R^{10}$$

is hydrogen, methyl, ethyl, propyl, isopropyl, n-butyl, tert-butyl, n-pentyl, n-hexyl, methoxymethyl, ethoxymethyl, methylthiomethyl, methylthioethyl, methoxycarbonylmethyl, ethoxycarbonylmethyl, 2-ethoxycarbonylethyl, difluoromethyl, 2-chloroethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, cyanomethyl, cyanomethyl, vinyl, allyl, propargyl, phenyl, benzoyl, cinnamoyl, benzyl, 4-chlorobenzoyl, 4-methoxyben-

zoyl, formyl, methylcarbonyl, ethylcarbonyl, propylcarbonyl, isopropylcarbonyl, n-butylcarbonyl, 2.2,2-tri-fluoroethylcarbonyl, 5-bromopentylcarbonyl, methoxymethylcarbonyl, methyloxalyl, ethyloxalyl, propyloxalyl, isopropyloxalyl, n-butyl-oxalyl, methoxycarbonyl, ethoxycarbonyl, propoxycarbonyl, propoxycarbonyl, butoxycarbonyl, methoxyoxalyl, ethoxyoxalyl, propoxyoxalyl, butoxyoxalyl, cyclopropylcarbonyl, 1-methylcyclopropylcarbonyl, cyclopropylmethoxycarbonyl or 2-methoxyethoxycarbonyl, hydroxycarbonylethyl,

R<sup>6</sup> is hydrogen, fluorine or chlorine, is hydrogen, bromine or methyl,

n is 0, 1 or 2, provided that n is 0 when R<sup>3</sup> is methyl-carbonyl or ethoxy-thiocarbonyl,

is a single bond of Anti form or of Syn form,

is methyl, ethyl, propyl, isopropyl, n-butyl, isobutyl, sec-butyl, tert-butyl, n-pentyl, n-hexyl, cyanomethyl, 2-chloroethyl, 3-chloropropyl, 4-chlorobutyl, methoxymethyl, 2-methoxyethyl, phenoxymethyl, ethoxycarbonylmethyl, vinyl, isopropenyl, 1-propenyl, 2,3,3-trifluoro-2-propenyl, phenyl, 4-chlorophenyl, 4-methylphenyl, 4-methoxyphenyl, styryl, cyclopropyl, cyclopentyl, cyclohexyl, 1-methylcyclopropyl, methylcarbonyl, ethylcarbonyl, propylcarbonyl, methoxycarbonyl, ethoxycarbonyl or propyoxcarbonyl, or hydrogen,

is methyl, ethyl, propyl, isopropyl, n-butyl, isobutyl, tert-butyl, sec-butyl, n-pentyl, neo-pentyl, 2-methyl-butyl, n-hexyl, trimethylsilylmethyl, allyl, cyclopentyl, cyclopexyl, 2-methyl-2-propenyl, propargyl, 2-chloroethyl, 2,2,2-trifluoroethyl, 2,2,3,3-tetrafluoropropyl, cyclopropylmethyl, cyclohexylmethyl, benzyl or 4-nitrobenzyl

20 R<sup>10</sup> is hydrogen or methyl,

5

10

15

R<sup>11</sup> is hydrogen, methyl, ethyl, 2-chloroethyl, phenyl, 2-chlorophenyl, 2-methoxyphenyl or 4-trifluoromethoxyphenyl, and

Z is oxygen or sulfur.

- Pesticidal agents which comprise at least one compound of the formula (i) as claimed in claim 1.
  - 6. The use of compounds of the formula (I) as claimed in claim 1 for combating pests.
- 7. A method of combating pests, wherein compounds of the formula (I) as claimed in claim 1 are allowed to act on pests and/or their environment.
  - 8. A process for the preparation of pesticides which comprises mixing compounds of the formula (I) as claimed in claim 1 with extenders and/or surfactants.
- 35 9. Compounds of the formula (XXIX):

$$R^{6}$$
 $R^{7}$ 
 $CH-S(O)_{n}-X$ 
 $R^{2}$ 

wherein

n

40

45

50

55

R<sup>1</sup> is halogen,

R<sup>2</sup> is hydrogen or C<sub>1-4</sub> alkyl,

R<sup>6</sup> is hydrogen or halogen,

R<sup>7</sup> is hydrogen, halogen or C<sub>1-2</sub> alkyl,

is 0, 1 or 2,

X is cyano, optionally substituted  $C_{1-4}$  alkyl,  $C_{2-4}$  alkenyl,  $C_{3-4}$  alkynyl,  $C_{1-4}$  alkyl-carbonyl,  $C_{1-4}$  alkoxy-thiocarbonyl or carboxamidine and their salts, provided that when X is cyano,  $C_{1-4}$  alkyl-carbonyl  $C_{1-4}$  alkoxy-thiocarbonyl or carboxamidine and their salts then n is 0.

(12)

## **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3: 19.03.1997 Bulletin 1997/12

(43) Date of publication A2: 13.11.1996 Bulletin 1996/46

(21) Application number: 96106956.4

(22) Date of filing: 03.05.1996

(51) Int. Cl.<sup>6</sup>: **C07C 323/48**, C07C 317/28, C07C 323/52, C07C 337/04, C07F 7/10, A01N 33/26, C07C 323/22, C07C 335/32, C07C 317/24, C07C 331/04, C07C 329/16

(84) Designated Contracting States: AT.BE CH DE DK ES FR GB GR IT LI NL PT

(30) Priority: 12.05.1995 JP 137482/95 15.02.1996 JP 50744/96

(71) Applicant: NIHON BAYER AGROCHEM K.K. Tokyo 108 (JP)

(72) Inventors:

 Kitagawa, Yoshinori Moka-shi, Tochigi (JP)

Wada, Katsuaki
 Oyama-shi, Tochigi (JP)

Kyo, Yoshiko
 Oyama-shi, Tochigi (JP)

Otsu, Yuichi
 Oyama-shi, Tochigi (JP)

Hattori, Yumi
 Yuki-shi, Ibaraki (JP)

(11)

Obinata, Toru
 Oyama-shi, Tochigi (JP)

Abe, Takahisa
 Oyama-shi, Tochigi (JP)

 Shibuya, Katsuhiko Minamikawachi-machi (JP)

Andersch, Wolfram, Dr.
 51469 Bergisch Gladbach (DE)

(74) Representative: Linkenheil, Dieter et al Bayer AG Konzernverwaltung RP Patente Konzern 51368 Leverkusen (DE)

## (54) Benzophenone hydrazone derivatives as insecticides

### (57) Summary Of The Invention

Novel benzophenonehydrazone derivatives represented by the formula (I):

$$\begin{array}{c}
R^{5} \\
N \\
R^{4}
\end{array}$$

$$\begin{array}{c}
R^{7} \\
C \\
C \\
R^{7}
\end{array}$$

$$\begin{array}{c}
C \\
C \\
R^{7}
\end{array}$$

$$\begin{array}{c}
C \\
C \\
R^{2}
\end{array}$$

$$\begin{array}{c}
C \\
C \\
R^{2}
\end{array}$$

$$\begin{array}{c}
C \\
C \\
R^{2}
\end{array}$$

$$\begin{array}{c}
C \\
C \\
C \\
R^{2}
\end{array}$$

wherein,  $R^1$  is halogen;  $R^2$  is hydrogen or  $C_{1-4}$  alkyl;  $R^3$  is cyano, optically substituted  $C_{1-4}$  alkyl,  $C_{2-4}$  alkenyl,  $C_{3-4}$  alkyl-nyl,  $C_{1-4}$  alkyl-carbonyl or  $C_{1-4}$  alkoxy-thiocarbonyl;  $R^4$  is hydrogen, phenyl, optionally substituted  $C_{1-6}$  alkyl, optionally substituted  $C_{2-8}$  alkenyl, -CO-O-R<sup>9</sup> or

 $R^5$  is hydrogen, formyl, phenyl, optionally substituted  $C_{1.8}$  alkyl, optionally substituted  $C_{2.8}$  alkenyl, optionally substituted  $C_{3.8}$  alkynyl, optionally substituted  $C_{1.8}$  alkyl-carbonyl, optionally substituted  $C_{1.8}$  alkoxy-carbonyl, optionally substituted  $C_{1.8}$  alkoxy-carbonyl, optionally substituted  $C_{1.8}$  alkoxy-carbonyl, optionally substituted  $C_{2.8}$  alkenyl-carbonyl or optionally substituted benzoyl;  $R^6$  is hydrogen or halogen;  $R^7$  is hydrogen, halogen or  $C_{1.2}$  alkyl-carbonyl or  $C_{1.4}$  alkoxy-thiocarbonyl; n is 0, 1 or 2, provided that n is 0 when  $R^3$  is cyano,  $C_{1.4}$  alkyl-carbonyl or  $C_{1.4}$  alkoxy-thiocarbonyl, is a single bond of Anti form or of Syn form.

The benzophenonehydrazone derivatives of the formula (I) have excellent insecticidal activities.



## **EUROPEAN SEARCH REPORT**

Application Number EP 96 10 6956

|                                | DOCUMENTS CONS  |  |                                       |  |  |  |  |  |
|--------------------------------|---|--|---------------------------------------|--|--|--|--|--|
| Category                       | Citation of document with of relevant p   | indication, where appropriate,   | Relevant<br>to claim                  | CLASSIFICATION OF THE APPLICATION (Int.CL6)          |  |  |  |  |
| D,X                            | EP 0 355 832 A (SUM<br>February 1990<br>* claims *  | 4ITOMO CHEMICAL CO) 28   | 2,5-8                                 | C07C323/48<br>C07C317/28<br>C07C323/52<br>C07C337/04 |  |  |  |  |
| X, D                           | EP 0 003 913 A (BOO<br>1979<br>* claims *   | OTS CO LTD) 5 September  | 2,5-8                                 | C07F7/10<br>A01N33/26<br>C07C323/22<br>C07C335/32    |  |  |  |  |
| <b>Δ,</b> Σ                    | EP 0 566 534 A (CIE<br>1993<br>* claims *   | BA GEIGY AG) 20 October  | 2,5-8                                 | C07C331/24<br>C07C331/04                             |  |  |  |  |
| D                              | & JP 06 025 134 A   |  |                                       |  |  |  |  |  |
| 1                              | EP 0 581 725 A (CIE<br>1994<br>* claims *   | BA GEIGY AG) 2 February  | 2,5-8                                 |  |  |  |  |  |
|                                | & JP 06 184 079 A   |  |                                       |  |  |  |  |  |
|                                |   |  |                                       |  |  |  |  |  |
|                                |   |  |                                       | TECHNICAL FIELDS<br>SEARCHED (Int.Cl.6)              |  |  |  |  |
|                                |   |  |                                       | C07C   |  |  |  |  |
|                                |   |  | _                                     | ***************************************              |  |  |  |  |
|                                |   |  |                                       |  |  |  |  |  |
|                                |   |  |                                       |  |  |  |  |  |
|                                |   |  |                                       |  |  |  |  |  |
|                                |   |  |                                       |  |  |  |  |  |
|                                |   |  |                                       |  |  |  |  |  |
|                                |   |  |                                       |  |  |  |  |  |
|                                | The appearance of the second to the   | and the second s | 4                                     | ·  |  |  |  |  |
|                                | The present search report has b   | Date of completion of the search   | 1                                     | Promiser   |  |  |  |  |
|                                | THE HAGUE   | 21 January 1997  | Van                                   | Geyt, J  |  |  |  |  |
| X : parti<br>Y : parti<br>40cu | ATEGORY OF CITED DOCUME<br>cularly relevant if taken alone<br>cularly relevant if combined with an<br>ment of the same category | ple underlying the<br>ocument, but publi<br>date<br>in the application<br>for other reasons  | invention<br>ished on, or             |  |  |  |  |  |
| O : bon-                       | nological background<br>written disclosure<br>mediate document  | *****************************  | & : member of the same patent family, |  |  |  |  |  |

EPO FORM 1503 03.52 (PO4C01)